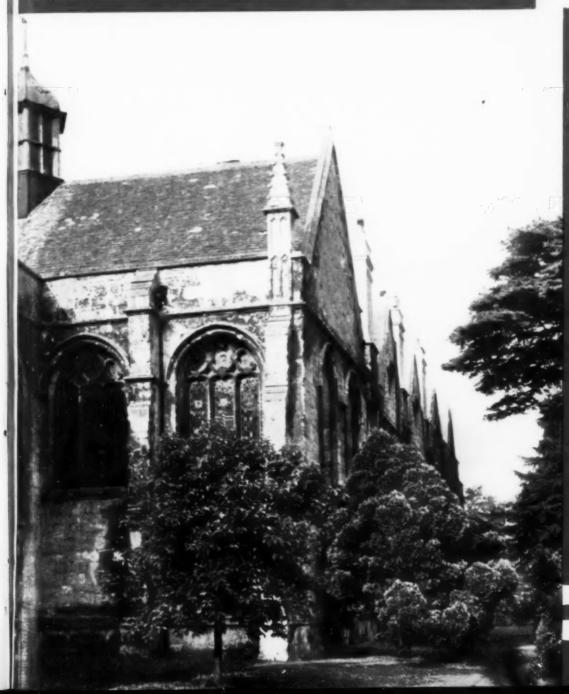
CANADIAN CEOCRAPHICAL JOURNAL

SEPTEMBER

VOL. XXV



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The Canadian Geographical Society

OTTAWA, CANADA

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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—first of Canada, then of the British Empire and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that will be popular in character, easily read, well illustrated and educational to the young, as well as informative to the adult.

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CANADIAN GEOGRAPHICAL JOURNAL

Published monthly by
The Canadian Geographical Society
at 2151 Ontario St. E., Montreal

Editor

Gordon M. Dallyn

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth, and other parts of the world in which Canada has special interest.

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The articles in this Journal are indexed in the Reader's Guide to Periodical Literature which may be found in any public library.

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Address all communications regarding change of address, non-delivery of Journal, etc., to the publication office, 2151 Ontario Street, East, Montreal, Canada, giving old and new address. On all new memberships, the expiry date will be printed on wrapper containing starting number. This will constitute a receipt for subscription.

Membership in The Canadian Geographical Society is \$3.00 per year in Canada and other parts of the British Empire, which includes delivery of the Journal, postpaid; in United States, Mexico, France, Spain, Central and South America, \$3.50; in other countries, \$4.00. Make membership fee payable at par in Ottawa.

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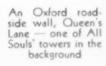
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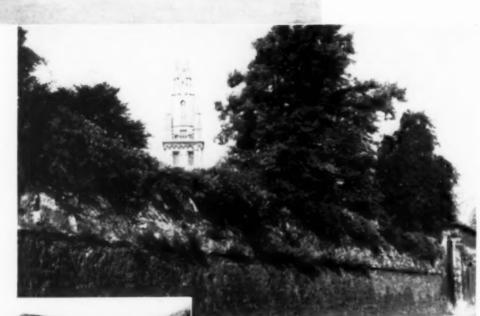
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PRINTED IN CANADA



New College Garden and the ancient city wall of Oxford







Ancient city wall (winter) in the garden at New College, Oxford

SOME OXFORD GARDENS

by J. D. U. WARD

THE history of Oxford's college gardens goes back far, since most of the older colleges were originally founded and staffed by monks, and in the middle ages monks interested themselves particularly in horticulture. Yet, though many spires and towers, cloisters and halls at Oxford are medieval, scarcely any of the existing gardens retain the medieval spirit. Possibly the cloister garth at New College and the tiny "Nun's Garden" at Queen's College are partial exceptions, but the knot gardens, the herb gardens, the rigidly formal plots, the trees trained and clipped into unnatural shapes, even the seventeenth century "living sundials" formed of box and yew-nearly all these things were changed in the eighteenth century, when the genius of Capability Brown for landscape gardening brought other styles to favour.

Now, even formal beds of flowers are few and far between in Oxford; trees and lawns and wilderness gardens, with herbaceous borders against old walls, are the order of our time and the prevailing motifs in Oxford's three finest and most famous gardens, those at New College, St. John's College and Worcester College. Still, the walls and many of the trees can claim a fair antiquity, and here it should be noted that the walls are a feature of many Oxford gardens. (In England, walls are liked even in modern gardens, since privacy is a highly-ranked quality in the English scheme of things. This was even more pronounced in the past). Many of Oxford's walls, of course, help to enclose two gardens, one on either side. Other high walls, which serve only to shut a garden from the road, are yet a lovely sight from the roadside because of the self-sown plants which grow upon them: wild ragwort and snapdragons and "bloody warriors" start up from crevices in the masonry, while honeysuckle and jasmine, rambler roses and clematis, wistaria and virginia creepers, having climbed ten feet or more from the garden inside, overhang the top of the wall to the great advantage of the highway's appearance.

New College Garden, entered through a remarkably fine wrought iron screen

which dates from 1711, has the special advantage of being enclosed on two sides by the best surviving portion of the great wall built in the fourteenth century to encircle and defend the city. Below are blossoming trees and shrubs and a rich confusion of the old-fashioned flowers which are most popular in college gardens: larkspur and pansies, sweet williams and Mrs. Sinkins pinks, lavender and cherry pie, poppies and lilies and roses of many kinds. On another side is an avenue of lime trees, much burled about their trunks and-in the time of their floweringmurmurous with bees. There are also stately elms and horse-chestnuts, a copper beech, a walnut and a catalpa

Not quite in the centre of New College lawn is a great mound, so grown with trees and shrubs as to be a jungle in miniature. This is, even in its present form, a reminder of the older style of gardening; it was begun in 1529-30 but not until 1648-49 was it "perfected with steps of stone and setts for the hedges about the walk"—features which have long since been removed. These mounds (a portion of another survives in Wadham College Garden) were the pride of many older gardens planned on an ambitious scale. It will be recalled that Francis Bacon specified for a "prince-like garden"

"a fair mount with three ascents and alleys enough for four to walk abreast;... and the whole mount to be 30 feet high; surmounted by a fine banquetting house with chimneys neatly cast."

The mound at New College is sometimes known as Mount Parnassus and it has been suggested that the idea of these garden eminences is derived from the "high places" of the Bible. The dates already given indicate that the New College mound was not (as is sometimes asserted) built for King Charles's cannon.

As the cloisters of New College are some distance from the garden proper, they are easily missed by the gardenseeker. Yet these cloisters should certainly not be overlooked: some experts (for instance, Miss Eleanor Sinclair Rohde in her Oxford College Gardens) think that the garths or areas surrounded by Oxford



New College Cloisters

cloisters were the earliest type of pleasure gardens in medieval England. Now, they are usually plain lawns, but the cloister garth at New College can boast not only an ilex tree but also a few ferns and flowers round the edge; a white rose, anchusa, foxgloves, hollyhocks, jasmine and berberis, and even one or two sapling sumachs. The cloisters themselves date from 1400 and were intended as a burial place for Fellows of the college but their uses have been various: during the Civil War they served. together with the adjoining bell tower, as a magazine in which gunpowder, cannon balls and other arms were stored for the Royalist forces.

The garden of St. John's College is fortunate in having, on one side, that part of the library which is sometimes regarded as the finest piece of late Gothic architecture in England. Wistaria and clematis adorn the grey stone walls, and the fine lawn is fringed by trees, behind which is a wilderness garden, specially beautiful in spring. But the most famous feature is the relatively modern rockery. This treasury of rare plants, some of them contributed from the far corners of the world by their actual collectors, acquired an almost European reputation under the late garden-master of the college. The path leads past this rockery, back to the library front, where Professor G. M. Trevelvan's memorable words may be recalled

"The garden front of St. John's, Oxford, is beautiful to everyone; but for the lover of history its outward charm is blent with the intimate

feelings of his own mind, with images of that same college as it was during the great Civil War. Given over to the use of a court whose days of royalty were numbered, its walks and quadrangles were filled, as the end came near, with men and women learning to accept sorrow as their lot through life, the ambitious abandoning hope of power, the wealthy hardening themselves to embrace poverty, those who loved England preparing to sail for foreign shores, and lovers to be parted for ever. There they strolled through the gardens, as the hopeless evenings fell, listening, at the end of all, while the siege guns broke the silence with ominous iteration. Behind the cannon on those low hills to the northward were ranked the inexorable men who came to lay hands on all this beauty, hoping to change it to strength and sterner virtue. And this was the curse of the victors, not to die but to live, and almost to lose their awful faith in God when they saw the Restoration, not of the old gaiety that was too gay for them and the old loyalty that was too loyal for them, but of corruption and selfishness that had neither country nor king. The sound of the Roundhead cannon has long ago died away, but still the silence of the garden is heavy with unalterable fate, brooding over besiegers and besieged, in such haste to destroy each other and permit only the vile to survive. St. John's College s not mere stone and mortar, tastefully compiled but an appropriate and mournful witness between those who see it now and those by whom it once was seen. And so it is, for the reader of history, with every ruined castle and ancient church throughout the wide, mysterious lands of England.

What is now Worcester College was originally a Benedictine foundation with another name, and some of the fifteenth century Benedictine buildings still look upon that tree-shaded lawn which sweeps down to the lake, fringed with red-hot pokers and beloved of the swans, the shelducks, the Muscovy ducks and the

St. John's College, Oxford — Garden front, (i.e. The Library of 1635)



Trinity College Garden, with Sir Christopher Wren's creeper-clad buildings behind



Worcester College, Oxford — the old Benedictine buildings (winter)

water-hens. Worcester has a short but broad herbaceous border, backed by an ancient wall whereon clematis and roses display their beauties, but the fine and varied trees (copper beech and hornbeam, plane and ailanthus, ilex and chestnut, aspen and many another) are, with the lake, the garden's chief riches. It may be fitting, in this quiet and lovely place, to remember that gardening owes more to the Benedictines than to any other monastic order. Since the discipline of the Benedictines forbad the eating of the flesh of any four-footed animal and made manual labour an obligation, the cultivation of herbs, vegetables and fruits was methodically studied. Much later, in the eighteenth century, the lake at Worcester College, combined with the garden and the relative remoteness of the situation, won for this

place the nickname of "Botany Bay"!

The garden of Merton College has received less than its due of appreciation. Here are good lawns and flowers, an avenue of beautiful limes and a terrace which has been raised against another part of the ancient city wall - formerly twice its present height at this point. Here in Merton Garden walked Henrietta Maria. consort of the luckless Charles I, for she lived in Merton College during a year of the Civil War. And here walked Katherine of Braganza (Queen of Charles II) when she had fled from London to Oxford because of the great plague of 1665. When I visited the gardens in June there were children playing with a hose, which was turned in fun upon an infant of some four summers. Finding that her sole garment, a one-piece playsuit, was uncomfortable when wet, she doffed it, and trotted after the older children, who had run away laughing. Promptly a middle-aged male appeared, evidently the infant's father and perhaps one of the college Fellows, but now rather flustered and shocked. There was the sound of sotto voce reproaches, and from behind a bush the child re-appeared, clad in her garment, but tearful that she should be brought back to sit with Mother and not be allowed to follow her companions.

Merton has a venerable mulberry tree, with many of its branches propped. The Master's Garden at University College and the Fellow's Garden at Queen's College and Wadham College Garden all have other mulberries, notable for one reason or another, but the largest mulberry in Oxford belongs to Balliol College, which

has a garden whose other chief features are its espalier apple trees and its fine chestnuts. Most of the older mulberry trees probably date from the time (1605-15) when James I was seeking to make England a silk-producing country; the mulberry trees were to provide leaves for the silkworms, but James made the error of distributing *Morus nigra*, instead of the more delicate *Morus alba* whose leaves are specially beloved of silkworms.

Corpus Christi College has a small but charming garden with the college's classic façade, lovely with clematis and a tulip tree, as its background. Here, too, is another section of the city wall, and, even more ancient, a part of the Saxon earthwork, more than a thousand years old, against which the wall was built. This small college, which has a high reputation for scholarship, was in the past mildly famous for its bees, and even now its flowers are noteworthy for their fragrance.

Christ Church Garden adjoins that of Corpus and has the other side of the same old city wall - for growing figs. This Christ Church Garden is exceptional in that it is of quite recent origin and was made from a kitchen-garden-cum-orchard, some of whose apple trees still remain to shade deck chairs so arranged upon the lawn that either the east end of the cathedral or the gorgeous herbaceous border and Merton Tower may delight the eye. The War Memorial Garden, at the extreme south-west of Christ Church, is also modern but is well worth seeing. Dean's Garden, where Alice Liddell's rabbit ran away and so gave Lewis Carroll the first germ of Alice in Wonderland, is private, but may be seen from an upper window of Christ Church Library. Christ Church now has a Canadian dean, Dr. John Lowe.

Wadham College Garden is green and shady, with relatively few flowers, but a noble copper beech, a cedar (somewhat mutilated), limes, and other trees. When I went there last the members of the college amateur dramatic society were rehearsing one of Dryden's plays, with the copper beech, whose lower branches grow along the ground, as backcloth. To the north is the modern garden of Rhodes House, its border filled with a medley of purple and pale lemon irises, wallflowers and yellow poppies, thrift and London pride, lupins and anchusas. On the lawn



Christ Church Garden — in background, Martin Tower and a tower of Corpus Christi College



In Magdalen College Garden — the new (18th Century) buildings appear in the background, and the gates leading to the water walks are in the foreground.



A tower of Wadham College - a scion of Shakespeare's mulberry tree is in foreground.

lay a circle of blooms fallen from the chestnut, pink dust on a green field.

Across the road is the main garden of Trinity College, dating from monastic times. There are good yew trees and a grove of limes or lindens (planted in 1713) on one side, and a herbaceous border (where I found the college tortoise) on the other, while, in the centre, broad lawns sweep up to those of the college buildings which are Sir Christopher Wren's earliest work in Oxford. And these very buildings are a continuation of the garden, for they are now clad with creepers and nearly every window boasts its box of growing flowers. Trinity's rose garden is tucked away in a corner, behind the yews and the limes.

The garden of Exeter College has several features of interest. There is Bishop Heber's chestnut, so-called because it shaded the windows of Heber when he was at the neighbouring Brasenose College. and Dr. Kennicott's fig-tree. The tale of the latter is worth recounting. Dr. Kennicott, sometime Fellow of Exeter and a famous Hebrew scholar, was very fond of figs. Thinking to bespeak for himself a

The War Memorial Garden, Christ Church



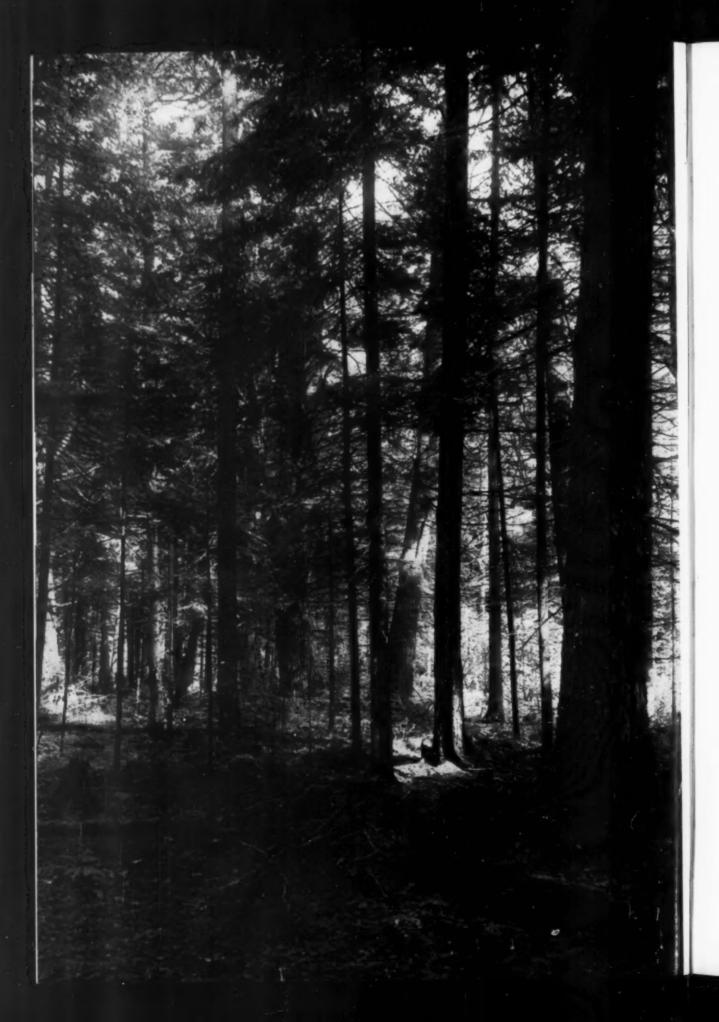
certain nearly ripe specimen, he attached a label, "Dr. Kennicott's Fig". An undergraduate stole the fig and replaced the learned Don's note with another which read. "A fig for Dr. Kennicott". Exeter Garden is walled on one side by the Bodleian Library, and views of the garden are well known to readers in "Duke Humphrey", some of whose more desirable window seats command an enchanting prospect. In a lease dated Lady Day, 1581, it was stipulated by Balliol College, who owned the ground and let it to Exeter College, that "Exeter shall not make any bowling allee or tenniss court which may be noisome to students, or any hogsty or dunghil or any other filthy savour". This is the more interesting because the game of bowls, as played at that time by Sir Francis Drake at Plymouth, is now recognized and permitted on most of Oxford's larger lawns. There could scarcely be a more sedate pastime, if "sedate" be read for its spirit rather than its precise deriva-

Pembroke has an ivy-clad quadrangle and window boxes filled with gay flowers, but this college of Dr. Johnson has scarcely any real garden. Lincoln, Oriel and Brasenose Colleges are no better off, nor can the charmingly rustic quad of St. Edmund Hall really be called a garden. But there still remains the garden of Magdalen, the college of the lily and perhaps the most fortunate - in its buildings of all Oxford's colleges. The superb cloisters, whose "every buttress beareth an antic", surround a garth on which Cromwell and Fairfax played bowls. Beyond lie the lawns of the garden proper: on the left a giant plane tree, with the deer park behind, in the centre the new (eighteenth century) buildings, and on the right a border rich with wallflowers and polyanthus in early spring, then irises and poppies, and later delphiniums and Canterbury bells. and later again the stately hollyhocks. Here, where a path cuts the border, are the gates leading to the water walks, a part of which is known as Addison's Walk. At all seasons these walks are beautiful but perhaps especially in spring and fall. Here the song birds seem in May to excel themselves—yet when I once came in midwinter, after a blizzard, I reflected that the scene could scarcely be more lovely, not even during the two weeks of spring when the meadows are purple and white with fritillaries.

The botanic or physic garden across the road from Magdalen is the oldest in all England and has, in itself and its history, material enough for two volumes; but it is not a college garden. Its water-lilies, however, have international fame, and the rockery at one end is usually so good that no visitor should miss it. The garden's entrance gateway is by Inigo Jones.

In conclusion I should like to suggest that, though the three best have some reputation beyond the city and the university, Oxford's gardens have less fame than they deserve. It is perhaps natural that most people should give chief reverence to ancient and beautiful buildings, yet days or even weeks might be devoted, with advantage and to the edification of the spirit, to contemplation of the gardens of Oxford.





THE HISTORY AND STATUS OF FORESTRY IN ONTARIO

FOREWORD: As Minister of Lands and Forests for the Province of Ontario, I was pleased to comply with the request of The Canadian Geographical Society for a composite article dealing with the expanding work of this Department, particularly with regard to the conservation and use of our land and forest resources, both in the past and present, and to our plans concerning the role these should play in the post-war period. Each topic in turn is handled by a specialist in that particular field, and all information given may be regarded as authentic.

I venture to hope that this article may have far-reaching effects upon Canadian readers, for it is only with public understanding and support that the Department of Lands and Forests is enabled to play its full part. We can plan for the future and hope for ever-improving results in our work of administration and conservation, but the enthusiastic co-operation of the general public is necessary in all conservation plans that we may render the best account of our stewardship of Ontario's forest heritage to its owners — the People.

N. O. HIPEL

Introduction

THE purpose of this article is to show the development of the work of the principal divisions of the Ontario Department of Lands and Forests and the part they have played and will play in opening up and protecting a new country.

In the early days of Ontario, land-hungry people in large numbers were moving in from Europe and the American States in the hope of founding a new home in the Canadian wilderness. Great movements of people in search of new lands have repeatedly brought war and misery to many countries of the world, and it is not surprising that trouble should have evolved in Canada. Many difficulties arose in devising laws to meet the needs of the country, and the story of the gradual improvement of these laws is full of interest.

Love of the soil is a fundamental characteristic that is found even in the most confirmed city-dweller. This feeling is most strongly developed in a young country where the first to go in are pioneers who hope to make a home for themselves in the new land. As time goes on, their descendants lose the keen feeling of their parents for the soil and seek an easier living in the towns and cities. Usually a desire arises for a return to the land and another migration develops from the city to the country.

Forests and farms are the foundation of our life. Green plants change part of the energy of the sun to meet the needs of man, and life, as we know it, would cease without them. They can supply most of

our needs in food, clothing and shelter through an almost endless variety of products, and they are restorable if used wisely. All other resources may be destroyed, but we can return again and again to reap the harvest of farm and woodland if the laws of nature are observed.

The policies of the past and the changes that occurred in them necessarily take up part of this article. The hopes of the future are built on present regulations that envision full and wise use of our soil to the lasting benefit of all.

PART I

Land Administration, Settlement and Recreation

1.—Land Administration and Settlement

"The Governor and Company of Adventurers of England trading into Hudson's Bay" in 1670 received the first charter on record in British Canada. This charter covered a vast territory, part of which is now Ontario. The only payment they were required to make was "two elks and two black beavers" whenever and as often as His Majesty, His Heirs and Successors should enter the Company's territories. The succeeding Hudson's Bay Company surrendered its immense power to the Dominion Government in 1868 in consideration of a payment of 300,000 pounds sterling.

When the British occupied French Canada in 1763, a modified feudal method of land tenure known as the "Seigniorial System" was in use. By this system large



A raft of virgin timber, photographed near Kingston on the St. Lawrence River in 1890. Binding up with willow branches or "withing-up", as it was then called.

grants were made to prominent men who were responsible to the Government for performing the duties and putting settlers on the land. The seignior retained various rights on the lands of his tenants, such as the right to certain minerals and timber, while the tenant rendered homage to the seignior in place of the sovereign, and paid certain rents to him for the use of the land. Usually these rents consisted of a few fowls or animals or a small number of bushels of grain yearly. The method was well suited to the temperament of the French farmer of that time

A few seigniorial grants were made before 1763 in what is now Ontario, but by 1791 settlers of other than French origin were pouring into the colony from Europe and the United Empire Loyalists were moving in from the American States. A clamour arose for a different system of land grants. and the Constitutional Act was passed separating the known part of British territory into Upper and Lower Canada divisions which were later to develop into the provinces of Ontario and Quebec. Some of the measures used under the Seigniorial System were employed in the land laws for the new country.

Any person who wished to move from Lower to Upper Canada could surrender any land he held there and receive an equivalent grant in his new home.

Petitioners for lands, on proving ability to cultivate and improve the lands and taking an oath to uphold the authority of the Crown, received two hundred acres. A survey was ordered and the plan was to be delivered within six months to be followed immediately by a patent! The patent reserved all minerals and timbers such as oak and pine for the use of the Royal Navy. The only expense to the patentee was supposed to be the expense of passing the patent which was to be fixed

and posted publicly

Here, when the new colony was only beginning, appeared the first causes of troubles that were to fester and finally break out in rebellion. First there was the Clergy Reserve Measure by which oneseventh of the land was reserved for the support of a Protestant clergy; then oneseventh was reserved for future disposal by the Crown; finally, favoured applicants, on petition to the Governor, could receive up to one thousand acres more than the two hundred-acre grant and, later still, further grants. Dead people and unborn children had their names put up for land and it was often granted. The result of all this was that genuine settlers, on occupying their land, often found that they were settled on the poorest, while large blocks belonging to the "Clergy Reserves" and absentee landlords separated them from

^{1.} When used in reference to lands this means the instrument of title given by the Crown when an estate is created in favour

their neighbours and prevented the establishment, in such sparsely settled regions, of any rural amenities such as good roads.

schools, or hospitals.

The first effects of the vicious "Family Compact" system soon began to be observed. By this, favourites and relatives of the members of the Government were granted extensive land areas as well as other benefits, and the welfare of the people at large received small consideration.

In 1792 fourteen counties were established in Upper Canada and seven land boards of four or more men each were appointed to supervise land disposal.

(In 1819 the land boards were given authority to settle people on lots of one hundred acres in their districts to relieve the pressure of applications on the central

government.)

Indian lands throughout Ontario were acquired by treaty and purchase from the various tribes, and settlement was usually not permitted before this was done. Purchases were sometimes made by individuals and later ratified by the Crown.

Now there appeared, for the first time in the land regulations of Upper Canada, a principle of the Seigniorial System. This was a stipulation that, in future, grantees must erect a habitable house on the land and clear and fence five acres in one hundred. In slightly changed form, this

regulation still exists in 1942

Also, at this time, the poor people were allowed fifty acres free of all fees. They were then debarred from further grants. The size of grants to others was raised at the same time and the inequalities of the land disposal system were increased. Individuals received up to 48,520 acres for very small sums of money. Large grants were made to members of the Government. magistrates, clergymen, lawyers and to surveyors as payment for their services. Some people received large areas and proceeded to get settlers to live on them. The settler received only the patent, and that at his own expense, but had to pay an annual rental to the land holder.

Grants of two hundred acres were made to United Empire Loyalists and to their sons and daughters when they came of age. Many of these grants were sold to speculators at prices, for a two hundred-acre tract, ranging from a gallon of rum to six

pounds sterling.

Tow-barge used in 1890 to bring square timber from Georgian Bay to Kingston

British soldiers also received grants of two hundred acres or more according to rank. Their settlements were usually on what is known as military reservations and under the control of an officer. They received aid and subsistence while they were getting established and were obliged

to help others in like fashion.

In 1825 the Clergy Reserves were valued at three shillings per acre. The sale to the Canada Company of one-half of these lands was authorized, but the company chose to take a larger acreage of other lands for the same total price. The total area later bought by this company included 2,484,413 acres. One-third of the purchase price was to be spent on improvements such as roads, churches, schools, wharves, and canals. The remaining twothirds was turned over to the Government.

An Order-in-Council at this time provided for valuation of the Crown Lands and the fixing of an average price, for each district, at which they were to be sold. Payment could be made in cash at a









discount of ten per cent, or in instalments. Fee simple2 grants were made on receipt of money, but mines, minerals and white pine timber were reserved. The largest quantity sold to any purchaser was 10,000 acres, the smallest 100 acres. Free grants had a maximum of 1,200 and a minimum of 100 acres. Here again, the amounts could be increased by petition to the Governor. Applicants for free grants of over 200 acres were supposed to give evidence of their ability and intention to expend one-half the estimated value of the land on improvements, or, in the case of areas up to 200 acres, to prove that they intended to reside on the lands. Quit rents3 of five per cent were charged on free grants with the first seven years' fees. These rents could be eliminated by paying in one sum twenty times the annual rent. Patent was granted in seven years, or, if the applicant had failed in his duty, the land was forfeited.

United Empire Loyalists and others entitled to free grants by general regulation were not affected by the new rules.

In 1831-32, officers of the Army and Navy who had bought land received a remission of the purchase price according to length of service. This varied from three hundred pounds for twenty years' service to one hundred and fifty pounds for seven years'. In 1833, Lovalists and militia were denied deeds to lands unless they had resided upon them for two years, or, if residence was impossible, they were given a location ticket entitling them to the sale price of the lands. Quit rents were abolished and free grants, except to soldiers and lovalists, were dropped; lands were to be laid out in one hundred acre lots; sales were to be advertised publicly and the purchase money was to be paid in not more than four instalments and in not more than two years. The names of those in arrears were to be posted and the lands sold at the next public sale.

Column at left: Stages in building a flume



^{2.} This may be defined as the complete or absolute title to the land.

³ This was a term given to a lump sum form of payment in lieu of a number of annual rentals.



Logging dam, Opeongo Lake, Algonquin Park

As a result of the new Land Act of 1838, those entitled to free grants could select them in any district, and soldiers were not confined to special military reservations. Public lands were not to be sold privately without being first offered publicly at an upset price⁴. Resident Crown Land agents were appointed in each district.

In 1839 Lord Durham made his report on the rebellion of 1837-38 and his recommendations were:

Union of Upper and Lower Canada.
 Responsible Government for both

provinces.

3. Abolition of the Clergy Reserves and a revamping of the land disposal system to remove favouritism and give the ordinary people a chance. One measure stressed as

urgently necessary was speed in granting patent; to use Lord Durham's words, "Immediate despatch with title is what is required to encourage purchasers, and prevent uncertainty and discontent".

The amount of Crown Land alienated at this time was 4.871,933 acres out of

17,000,000 acres surveyed.

King's College (University of Toronto) and Upper Canada College in 1840-41 received 225,944 and 66,000 acres respectively as their share of the land set aside to

support grammar schools.

By 1842 the disturbances accompanying the rebellion had subsided, and Upper and Lower Canada were united in a legislative union; the executive councils of both were made responsible to the popular assemblies. A Land Act was passed which

Bottom row:- The finished flume carrying logs direct to the barking plant.





^{4.} This denoted the lowest selling price of land which would be accepted at public auction.

provided for the settlement of free grant claims by the Governor-in-Council. All land claims were commuted for scrip⁵ good at subsequent sales except for clergy or school lands. Land prices were to be fixed by the Governor-in-Council from time to time. Free grants of fifty acres were to be made to actual settlers in the vicinity of public roads. Land in arrears of payment, or on which settlement duties were unfulfilled two years from the passing of the Act. was advertised and sold

Common schools were aided in 1850 by the setting aside of one million acres of land for their support. The price at which it was sold, twelve shillings and sixpence. was later reduced to ten shillings per acre. This was followed shortly by an enactment fixing the price of all Crown Land at seven shillings and sixpence an acre west, and four shillings an acre east, of the Counties

of Durham and Victoria

The Land Act of 1853 authorized the Governor-in-Council to fix land prices and terms of settlement. Free grants to settlers in the vicinity of public roads were raised to one hundred acres. The appropriation of a part of the proceeds from the sale of Crown Lands and school lands was made as a fund for public improvements. No person who was in arrears for all or part of the purchase price of Crown Lands could vote in an election as a property holder. The following year, Clergy Reserve lands were secularized

The price of Crown Lands was set in 1859 at seventy cents per acre cash, or \$1.00 in instalments to be paid over four years. No patent would be issued, even where the land was fully paid for, unless the applicant entered into residence on the land within six months and within four years had ten per cent under crop. Many previous references had been made to the principle of residence on the land, but this is the first clear-cut mention of the time required in residence. We have seen how, in 1819, cultivation of a definite part of the land was required, and it was pointed out that this was a first principle of the old seigniorial grants. Residence on the land was also a major requirement under that system. These two principles are the basis of our Public Land Act to-day.



5. This meant the granting by the Crown of a form of acknowledgment of a claim for a grant of land free of charge, or for the payment of money which had been reduced to the status of a credit on the pur-chase price of Crown Lands.

"Spare time" is utilized in building up firewood reserves.



Water is hauled for camp use.

In 1861 the Canadian Land and Emigration Company purchased ten townships of 403,125 acres from the Crown. The price per acre was fifty cents, one-tenth of which was to be expended by the company on roads, and 261,544 acres were to be settled by the end of fifteen years.

Following Confederation, an Act to Secure Free Grants and Homesteads was passed in 1868. Under it, the Lieutenant-Governor-in-Council could appropriate any public lands, not valuable for pine timber or minerals, for free grants to actual settlers. Patents were issued after five years if the settler had fifteen acres under cultivation, a habitable house sixteen feet by twenty feet, and had resided continuously on the land from the time of grant. The sole male or female head of a family with children under eighteen years of age could be located for two hundred acres. Any male without children under eighteen could be located for one hundred acres. If the land was rocky or swampy, the allotment could be increased so as to make the stated amounts available for agriculture. A male head of a family could purchase one hundred acres additional at fifty cents per acre.

When the operation of the Act was extended to the Rainy River District the arrangements were: a male head, or sole female head of a family with children under eighteen could be located on one hundred and sixty acres; eighty acres additional could be purchased for \$1.00 per acre: a male of eighteen without children could locate for one hundred and twenty acres and purchase an additional eighty acres at \$1.00 per acre. The time required for patent was three years.

Mines and minerals and pine timber were reserved, but the pine timber was surrendered to the patentee. Because settlers were locating on lands solely for the timber, an amendment to the Act was passed in 1880 reserving the pine. The patentees were to receive a portion of the pine timber dues received by the Crown.

Larger grants for railway construction were made to the Grand Trunk Pacific,



Red pine demonstrates its natural reproductive powers. An open stand

The Algoma Central and the Algoma Eastern railways.

Following the Boer War a gratuity of one hundred and sixty acres was granted to war veterans. This gratuity was later extended to other veterans and some 16,000 certificates were issued. The land was given in fee simple without reservations.

The most recent legislation on the disposal of Crown Lands is contained in the Public Lands Act (R.S.O. 1937), and the regulations passed under it. It is a modernization of the Act of 1868, and provides for an inspection of land by competent persons before it is granted or sold. Free grants are made only to returned soldiers and they must fulfil the residence and cultivation requirements. The price is fifty cents per acre throughout the province, but the acreage that may be bought varies slightly with the district. To obtain land, an applicant must be a British subject and a male of eighteen years and up or the sole female head of a family with children under eighteen years. and must own less than 300 acres of land. no matter how acquired, in all districts but Cochrane and Timiskaming, where the amount is less than 160 acres, no matter how acquired. Thus, for the whole

province it may be said that 300 acres is the maximum acreage of Crown Land obtainable. The full price must be paid when application is made. Erection of a habitable home, at least sixteen feet by twenty feet, and residence for six months of each of three years are required, as well as cultivation of a specified acreage, varying with the district from ten to about twenty per cent of the total grant. Mines, minerals and pine timber are reserved, but if the pine timber is not more than a specified amount it may be obtained, by the patentee, on easy terms. In the Rainy River District the pine passes automatically to the patentee.

Provision is made for the obtaining of additional land for pasturage and woodlot.

Administration of the Act is by the Minister of Lands and Forests through thirteen district offices which are located throughout the province.

The Act provides for the use of land, for purposes other than agriculture or summer resorts, by means of land use permits renewable annually for a small fee.

The present regulations are designed to:

 Render simple and rapid the acquiring, by actual settlers, of land and title.

- Keep settlers from getting on barren soil where they can not make a living.
- Limit the amount of land obtainable while ensuring enough for the needs of any person.
- Make the acquisition of land for purposes other than agriculture easy.
- Protect the interest of the people at large.

It may be of interest to note here that the basis for granting land in areas of eighty to one hundred and sixty acres has been derived from an old Anglo-Saxon unit which was called a "hide". This was the amount of land (varying somewhat according to the nature of the terrain) which one ox could cultivate in one year. This area was considered sufficient to support one man.

The record of land settlement in Ontario from the early days shows some poor land laws, but also an unremitting search for better ones. This search must be continued so that the land requirements of the people may be satisfied by intelligent regulations which retain the good features of past legislation while embodying such new measures as are necessary to meet the changing needs of to-day.

2.—Recreation

The enjoyment and health of the people have not been forgotten in land disposal regulations. The sale, licensing, or leasing of summer resort lands is provided for by the Public Lands Act (R.S.O. 1937), and such lands are held from disposal for agricultural use. The Provincial Parks Act (R.S.O. 1937) has resulted in the setting aside of about 4,500 square miles of land to provide for recreation, game and fish protection, and the preservation of forests and stream flow.

The largest of these parks is Algonquin (about 2,740 square miles), named after the great family of Northern Indians and situated in the highlands of Ontario, south of the French River. It was established in 1893, and has acquired a nation-wide reputation as an ideal place for sport and recreation.

The second park is Quetico (about 1,740 square miles), established in 1909 in the famous section of the Rainy River country that was the scene of many wars between the Chippewa and Sioux Indians, and also of a long drawn out and bloody struggle between the Hudson's Bay Company and the North West Fur Company.





The other two parks, Rondeau and Ipperwash, are small areas on the shores of Lake Erie. They provide a place where nearby city dwellers may quickly find welcome relaxation from the strain of modern living.

Areas, attractive from a scenic and recreational point of view, that are outside the parks, will be developed as rapidly as possible when a demand for them arises.

Land Surveys

As soon as settlers started to pour into Canada in search of new homes, the need for a land survey became apparent. It was necessary to divide the country into blocks so that a section could be identified and assigned to an individual without danger of confusion or overlapping.

The first survey on record within the boundaries of present-day Ontario was carried out by Major Holland in 1783 near Cataraqui (now Kingston) on the St. Lawrence River.

After the passing of the Constitutional Act which separated Upper and Lower Canada, definite provision was made for a land survey and instructions were issued accordingly. These instructions provided for townships ten miles square, if inland, but with nine miles' frontage by twelve miles in depth if on navigable waters. These were to be subdivided into lots.

Anybody looking at a map of Southern Ontario must be struck by the lack of uniformity in the way the survey blocks were laid out. This resulted from the laying out of the first townships along the navigable waters, with two sides roughly at right angles to the direction of the stream. Then, as settlements were joined by roads, townships were surveyed in the interior, usually with little regard for the direction of the lines in the townships along the streams. Lots of from 50 to 100 acres for settlement were established along many roads (1842-1853).

Up to the time of Confederation (1867) it was generally the custom to pay surveyors in land grants, which did not encourage them to do their best work. The surveying equipment used was the magnetic compass and the old link chain, neither of which was adapted for accurate

large-scale surveying. Nevertheless, despite the great inaccuracies that often resulted, it must be said that the old-time surveyors did a good job.

As time went on, township sizes varied from six to ten miles square with lots of from 100 to 160 acres. Since 1906 they have all been nine miles square with lots of 150 acres each. The bearings of the boundaries are usually astronomical north-south and east-west. Transits and tapes have replaced the old compass and chain, and the professional standards of the surveyor are high. He is enabled to keep in touch with the developments in his field through the Ontario Land Surveyors Association incorporated in 1892.

Up to the present only 22 per cent of the province has been surveyed, but settlement has not overtaken the surveyor and no township subdivision has been done since 1932.

Early exploration and development of the wilderness depended on the surveyors, who kept careful notes. Some of these make interesting reading to-day. As meridian lines, base lines, and roads and railroads were laid out, a vast fund of information was built up that was of great value in the development of the country.

The surveyor has taken wings, and the camera, first used for survey work in England in 1860 and in Canada in 1887, is now used in an aeroplane. At first oblique photographs were widely used, but these have been largely replaced by vertical views. In conjunction with accurate ground work for correction of tilt or errors in altitude, an almost perfect map can be made at moderate cost.

The Aerial Survey Section of the Division of Surveys has, during five years, made surveys covering 23,783 square miles. Some objectives, beside map making, were to estimate quantities of timber, to spot locations for roads and highways, and to select sites for aerodromes.

The survey camera can do in a few hours what ground parties formerly accomplished in months. It must not, however, be supposed that the surveyor on the ground has been displaced. Rather he is more necessary than ever if the best use is to be made of the work of the flying camera.



Aerial photograph of forest near the mouth of Aguasalion River

PART II

Timber Management in Ontario

In the Napoleonic Wars the "Little Corporal" tried to reduce Britain to submission by means of a blockade, one of the important features of which was the cutting off of European wood supplies from the British Isles. England turned to Canada then, and from Canadian ports tall timbers were sent to build the King's ships. History repeats itself, and once again large shipments are being made to Britain.

Ontario, one of the leading timber producing provinces of the Dominion, is doing her share in the production of this vital material of war to help the United Nations on to victory.

With the ringing axe of the lumberjack in Ontario's north woods, production begins; the result is—lumber in its multitude of forms, export pulp and paper to provide the sinews of war. American dollars to purchase steel and tanks and planes.

Other historical events, while less spectacular than war, have been, nevertheless, important in the development of timber management in Ontario. In the early days

of settlement those intrepid pioneers who hacked out of the forest small clearings to lay the foundation of the future agricultural development of the province, did not regard the forest as a valuable natural resource, but only as an obstacle. Control of the products of the forest began only with the realization of their value. It was not until the beginning of the nineteenth century that lumber began to play an important part in the economic life of Eastern Canada. During the last half of that century the rapid expansion of the United States and an influx of people created a tremendous new market for lumber. Lumbermen from across the border were quick to realize the value of Ontario's pine forests. Timbered areas were snatched up rapidly and cutting was completed in the greatest haste, so eager were operators to enjoy the profits from the new American It was at this time that Ontario trade. experienced its greatest lumber activity. Pine cut from Crown Lands during the period of 1890 to 1910 ranged from 508 million feet in 1891 to 952 million feet in 1896, but about the year 1907, when 790 million feet of white and red pine were cut, the volume of production of these





Tractors and bulldozers facilitate forest-road construction.

species commenced to decline, and by 1937 this was only 154 million feet.

The tremendous development and expansion of the lumber industry during the latter part of the century could not be maintained without depletion of the pine forests; consequently, in 1898 Ontario enacted legislation that prohibited the export of unmanufactured logs from Crown Lands

The early years of the twentieth century saw a rapid development of the pulp and paper industry, to meet the requirements of which, many square miles of pulpwood timber were allocated. The depletion of the pulpwood resources of the United States placed a further demand upon Ontario's forests.

Timber or Forest Management

This has to do with the continuous cropping of forest lands.

In the mind of a tourist or a sportsman, forest land would be properly managed if scenic beauty were not disturbed, or if the forest provided the natural habitat for game, or if it regulated stream flow and maintained proper temperature for game fish

To an industrial concern, depending on wood as a raw material, forest values are expressed in dollars and cents. They are appraised in terms of volume, accessibility and profit. The policy of the Department is to manage forest land so that it will

vield a regular and continuous supply of raw material consistent with the ability of the particular area to produce.

In Ontario it is the people who own the forests, and they are interested in all the benefits that can possibly be derived from these when properly managed. While governments look upon the sale of timber as a source of revenue, those entrusted with the care and management of these resources must keep in mind all interests. To bring about a proper balance is often difficult and compromises provide the only solution.

Forest Resources of Ontario

No form of timber management can be contemplated without a thorough knowledge of forest conditions. To this end, the Department of Lands and Forests, together with private companies, has carried out forest surveys to cover three-quarters of the accessible forest land, and these surveys provide the basis for the Department's knowledge of the forested area of the province.**

Economic Importance of Ontario's Forests

The direct return to the Treasury of the Province of Ontario through the sale of forest products on Crown Lands is large. but the indirect revenue exceeds this many times over. Indirect revenue is expressed in terms of employment and wages of men in the harvesting and processing of sawlogs, pulpwood and other forest products the

als: 1917 — 208 million feet, 1927 — 177 million feet, 1937 — 154 million feet, For 1927 and 1937 jack pine is included. - 790 million feet

**A booklet entitled "The Forest Resources of Ontario" may be secured by application to the Department of Lands and Forests, Parliament Buildings, Toronto.

Since Confederation, the volume of white and red pine timber cut in Ontario is indicated by the following quantities, "Since Confederation, the volume of white which show the amount produced in ten-year interval 1867 — 161 million feet, 1877 — 330 million feet, 1887 — 629 million feet, 1897 — 528 million feet, 1

return to capital investment and the purchase of equipment and supplies.

Two great Ontario industries are dependent on the forest for their principal raw materials — the pulp and paper industry and the lumber industry.

The capital investment in pulp and paper mills in Ontario reaches a huge total, and many thousands of people are employed. The gross value of the products of these mills represents a major portion of the total value of the products of all manufacturing industries in the province.

The lumber industry in Ontario is concerned with the manufacture of sawn lumber of all dimensions, shingles, sawn ties, veneers etc., and the numerous mills give employment to thousands of people.

The huge pulp and paper and lumber industries are not the only ones which depend on the forest, however. There are a great number of other industries in which wood and paper are the chief, or at least important, components. In fact, there is practically no industrial activity which is not dependent to some extent, directly or indirectly, on the use of forest products; there is no doubt, whatever, that forest management in Ontario is "big business".

management in Ontario is "big business".

A resource of such importance in Ontario economy requires intelligent administration in order that the best interests of the province as a whole may be served.

Legislation

In regard to legislation, Ontario is well advanced. There is sufficient to provide for adequate control and supervision of all authorized activities. While the Department is constituted under the Public Lands Act (R.S.O. 1937, Chapter 33), the Acts of special importance in the management of timber are:

 Crown Timber Act — Provides for the licensing of Crown Timber and control of cutting. R.S.O. 1937, Chapter 36.

(2) Provincial Forests Act — This Act, formerly the Forest Reserves Act, allows for the setting aside of tracts of forest land which shall be handled under a system of forest management. There are eight Provincial Forests covering over 12,000,000 acres. R.S.O. 1937, Chapter 38.

Top:—Unloading 4-foot pulpwood from tramway at landing, Smoky Falls

Centre: Strip loading of 8-foot pulpwood

Bottom: -- "Spotting" sleighs on the dump









At the end of the drive. These logs were cut 150 miles north of the sorting gaps through which they now run. Dozens of men, employees of a boom company, sort the logs for the various companies. The logs sometimes are identified by paint marks on the butts, more often by a brand hammered or cut in the logs, or both.

(3) The Pulpwood Conservation Act — Legislation to bring about forest management under a system of regulated cutting on lands leased to pulp and paper companies. R.S.O. 1937, Chapter 41.

(4) The Provincial Parks Act — The portion of this Act dealing with timber management provides for disposition of timber within Provincial Parks under supervision directed towards maintaining scenic values and game protection. A more selective system of cutting is to be practised. R.S.O. 1937, Chapter 94.

(5) The Mills Licensing Act — This Act requires that all saw mills, pulp mills, mills operating for the production of lath, shingles, ties, veneer, cooperage, and barking or rossing pulpwood be licensed. Between 1,200 and 1,300 licenses are issued annually by the Department of Lands and Forests. R.S.O. 1937, Chapter 37.

(b) The Cullers Act - Provides for the examination, licensing and conduct of cullers c.: scalers measuring timber cut from Crown Lands. R. S.O. 1937, Chapter 240.

(7) The Mining Act — Affects timber management in that it specifies the rights to timber on mining lands. Lands patented prior to 1869 give to the patentee all timber - between 1869 and 1918 all timber other than pine - since 1918 timber is all reserved to the Crown, but permission may be granted to cut for use in the development of the property. R.S.O. 1937, Chapter 47.

(8) Forest Resources Regulation Act - Provides for the more efficient and economical operation of the forest products industries. Existing leased or licensed areas may be increased or reduced in size — kinds and quantity of timber which may be cut are regulated. R.S.O. 1937, Chapter 40.

Disposal of Crown Timber

Three methods prevail for the disposal of timber on Crown Lands — by public sale. by agreement authorized by Cabinet Council, and by permit. In public sales, upon application for timber, it is examined and its condition is reported. Tenders are invited, and the right to cut is usually awarded to the party bidding the highest price. The highest or any tender is not necessarily accepted. Agreements are invariably made in the disposition of large tracts for the continuous operation of pulp and paper mills. Permits are used where trivial amounts of timber are involved. The opportunity is presented to incorporate into licenses, agreements, and permits operating conditions to provide for the carrying out of whatever forestry measures are economically practical.

Measurement of Crown Timber

Only Ontario licensed scalers have

authority to measure and make returns of timber cut from the public lands. To become a licensed scaler, the candidate must pass an examination set by the Department of Lands and Forests. The scaling organization consists of a general supervisor of scaling, a district inspector of scaling, scalers and assistants. For log timber and board foot, volume is determined by the Doyle log rule; for pulpwood, the standard stacked cord and the cubed cord of 100 cubic feet are used; for square or waney timber, the cubic foot is used, and poles and hewn railroad ties are sold on a piece basis.

Some Examples of Timber Management

1. Management in the Clay Belt: through the history of land and timber administration in Ontario, the problem of Timber Farmers' has existed. Many settlers have acquired land, ostensibly to develop a farm, but actually to strip the timber, sell it to the market, and then abandon the lot. To discourage this practice, and yet provide bona fide settlers to engage in timber cutting, the Department has devised a plan, which is now in operation, under which genuine settlers are privileged to cut limited quantities of Crown timber in the Clay Belt. Fourteen townships have been studied and the permissable annual cut for each township has been determined. A bona fide settler is eligible to apply for the right to cut pulpwood on Crown Lands provided that he prove determined to undertake actual farming. that he has not more than two hundred cords of wood on his resident lot, and that he has ten or more acres under actual cultivation. This scheme is intended to bring about a balance between settlement, available Crown timber, and established industry.

Regulated Utilization: More complete utilization of jack pine is being accomplished by combining jack pine tie operations and jack pine pulpwood. The better logs go into ties, while tops and defective butts are converted into pulpwood

Efforts are being made constantly, through the medium of the conditions of sale or through agreements with licensees or concessionaires of Crown timber, to effect a more complete and economical utilization of the forest. On pulpwood concessions, provision is made in many cases to harvest the large material as saw logs, while the tops of these large trees are converted into pulpwood to avoid waste. Sawlog operators are also required to remove, as pulpwood, material too small for their purpose, which, if left uncut, would be uneconomical to operate and thus become wasted.

The utilization of all species is encouraged and promoted at every opportunity by the Department. In this connection it is gratifying to note the increased use of poplar — a tree formerly considered a weed species — for pulpwood, match stock, excelsior, etc.

Provision is being made for a more evenly distributed drain on the forest resources by permitting the establishment of industry on any certain area only to the extent that the available forest resources permit. In this manner, the forests will not be severely depleted in the most accessible areas while the less accessible areas remain largely uncut. For example, a large area lying north and west of Port Arthur and Fort William, and heretofore considered too inaccessible as a source of pulpwood tributary to the head of the lakes, is now being developed. Part of the pulpwood from this source will be used for export purposes, thus relieving the drain on pulpwood areas adjacent to established mills.

3. Management of Provincial Forests: In Timagami, a definite working plan, involving the utilization of 600 million feet of white and red pine, is operating. The quantity is related to the requirements of the established mills. No group is to have an advantage to the detriment of another. The cutting cycle will extend over a period of 25 to 30 years. All brush will be burned and a progressive planting programme has commenced with the object of filling in where nature fails to restock. By brush burning, the hazard of forest fires is removed and the ground that would have been covered by slash for from 10 to 20 years is made available for natural seeding, or planting in case of failure.

In Nipigon, a sale of timber involving an area of 85 square miles back from the east shore of Lake Nipigon carries special conditions. The cut is regulated to extend over a period of at least 20 years. A surcharge is being levied to pay for the removal of fire hazards and to carry on any work to reproduce the stand. This block is so situated that it can conveniently serve as an example of forestry practice to surrounding pulp concessions totalling, in area, over 10,000 square miles.

4. Management in Mining Areas: Plans have been formulated for a more intelligent timber disposal policy in an area comprising some 65 townships, or approximately 2,500 square miles, in the Porcupine mining area. The mining industry has created a large market for timber, lumber, dimension timber and larger sized logs in the round for posts, stulls, etc. Along with the operations producing this material



Uneven aged hemlockyellow birch stand, up to 300 years old

will be conducted pulpwood operations for delivery to one of the larger pulp mills.

5. Preservation of Scenic Values: The practice of preserving scenic values is becoming general over the entire province. Crown timber along highways, around lakes, and paralleling portage routes, will not be sold, nor, if licensed, be allowed to be cut if this involves marring the beauty of popular tourist routes. Around lakes and their portage connections, the timber is withdrawn from cutting for a distance varying from 100 to 500 feet. Timber along highways, if licensed, is withdrawn from cutting for 300 to 500 feet on either side, and made subject to restrictive handling.

6. Protection of Immature Stands: The Department fully recognizes the value of immature forests, the timber stands of the future. Measures are being taken to protect them, such as a diameter limit, which is now specified for white and red pine throughout the province. A diameter restriction is placed on spruce, balsam, cedar, hemlock, pine and hardwoods in Algonquin Park. Each individual sale may have its own diameter restrictions. Extensive areas of immature timber are being set aside to be created into provincial forests or added to forests already existing.

Timber growing at a sufficient rate to justify its being left standing is not offered for sale.

The foregoing constitutes but a brief outline of the work and problems of Timber Management in the Ontario Department of Lands and Forests. It is hoped that enough observations have been made to give a general picture of the various activities. A great many projects are indicated, and when a larger number of technically trained men becomes available, it is expected that considerable progress will be made.

Major problems include the re-estab-

Top: Jack pine-black spruce stand - 110 years old

Bottom: Jack pine on a sand plain 110 years old









Left to right, top row:-

A "pointer" and one of the great piles of logs lining streams of nothern limits in the spring

Drivers at work

Driver at work on a fast northern stream

The logs sorted, they are "boomed" and hauled to the mills by large towing boats. In the background, one is taking a boom of logs.

Centre row:

River drivers and their craft assembling a boom of logs.











TYPICAL SCENES IN

Top row, left to right:-

Beginning of construction of a truck track

Well cared-for forests such as this produce about a cord, per acre, per annum. A stack of 4-foot unpeeled pulpwood

Cutter sawing up a felled tree

Tractor haul

Left:-Loading sleighs



WOODS OPERATIONS

Centre row, left to right:-

Repairing the main road

Stacks of 4-foot wood—peeled and ready for the pulp mill

Harvest time in spruce forest

Loading logs on a sleigh

Right:-Log dump on Saganash Lake

Photos by Quimby Hess. Kapuskasing



lishment of forest areas of white and red pine, yellow birch, and spruce (the most valuable commercial species of Eastern Canada), and the division of the forest area into working units—for each of which industry may be established to utilize the quantity of timber which can be cut under a system of controlled volume. A

great deal of research will be necessary in the solution of these problems.

Ontario has a vision of a world beyond war, a sane world of human progress, and the application of human ingenuity in the management of her forests gives promise to her citizens that they will have a better land in which to live.

PART III

Forest Fire Protection in Ontario

The story of the development of forest fire protection in Ontario is inevitably intertwined with that of land settlement and lumbering. Throughout time immemorial, fire has been at work in the primeval forests of Ontario where, as a natural phenomenon, it originally exerted an important and determinative influence on the character of the arborescent vegetation. But only with the advent of civilization were definite land and forest values created, and for both the lumberman and farmer, who were engaged in the exploitation of them, fire assumed a very tangible importance.

Throughout the history of land settlement, fire has been closely associated with the lives and fortunes of those who have opened up the country for farming. In the long drama of pioneer life, it has played, and still plays, a dual role,—a role which has always excited a lively interest. From the day when the first pioneers entered the leafy forest along the lakes in Upper Canada to clear the fertile lands for farming, to the present time when the sombre spruce woods of the northern Clay Belt are slowly making way for settlement in New Ontario, fire has been at once both friend and foe, a Dr. Jekvil and Mr. Hyde, without whose aid the tree-encumbered land could scarcely have been cleared. but through whose fierce assault many a forest homestead has been destroyed and not a few lives lost.

For the lumberman, fire has always been a menace. In the early days, the

enormous visible supply of pine assured his future well in spite of fire; but burnt-out camps and blackened, smouldering trunks were from the first a not uncommon source of loss and a cruel disappointment to him.

It was not until the middle of the last century that the mounting destruction of forests by fire and axe began to be the cause of considerable uneasiness. Among the first to raise his voice was Sir J. W. Dawson*, who in 1849 deplored the frequency and extent of forest fires, and warned of the danger they presented to the continued prosperity of the timber industry. He noted incidentally the remarkable reproductive capacity of the forests, and explained the role which fire played in natural forest successions.

At this period, however, the conflicting interests of settler and lumberman created a situation which worked against conservative exploitation and forest protection. The current policy of land settlement, envisaged the ultimate employment of lands presently in timber berths for farming, after the timber values had been exploited for the benefit of the lumberman and the public treasury. The scheme proved feasible when land was essentially suitable for cultivation, but it could never be permanently successful when applied to the poor soils of the Canadian Shield. When settlement had filled the fertile lands of Old Ontario. and farmers were moving into the rough pine country farther north, settler and lumberman came into conflict, for wherever settlement went, bush fires invariably multiplied. The lumberman did what he could, therefore, to keep the settler out of the pine country.

^{*}Dawson, Sir J. W. "On the Destruction and Partial Reproduction of Forests in British North America": American Journal of Science and Arts, 4, pages 161-170, 1847.



Aerial view of Aguasalion River region, clearly defining forest types, cut-over areas and land features

During these years, the existence of a lively public interest in forest protection was indicated by numerous enquiries into subjects related to the management of the public lands and forests, and particularly into the question of the destruction of the forests by fire. Thus, in 1849 "the protection of forests from unnecessary destruction" was investigated. In 1854 a bill was introduced designed to prevent careless fire setting for clearing land in the woods. This bill was dropped in view of an impending report of a committee which had been commissioned with wide authority. report was disappointing in that no definite proposals were made; but it expressed the conviction that "important modifications of the system of management of public lands and forests were imperatively required. The statements and opinions taken in evidence revealed widespread alarm over forest destruction. In 1863, a committee advised against the opening of pine lands for settlement, and in the following year further enquiry was instituted "into the causes of the rapid destruction of pine", and into the expediency of reserving timber areas for forestry purposes.

Throughout the third quarter of the last century, the development of American markets for lumber more than made up for a decline of the square timber trade which set in, and lumbering activities reached new heights. As a result of exploration connected therewith, there was a growing appreciation of the true extent of the virgin pine resources, and although these were seen to be enormous, the terrific extent of fire damage became more and more apparent. Lumbermen and public alike were seriously concerned.

Thus, by the time of Confederation a fairly well informed public opinion was favourably inclined towards a policy of forest conservation. Unfortunately, pre-occupation with the larger political issues of the period caused pressing forest and land settlement problems to be set aside. Only in the last quarter of the century was real progress in forestry matters resumed.

At this point, reference may be made to early fires of which some record remains, and to those of more recent date which are particularly worthy of note.

According to report, large timber tracts were burned in the international boundary zone west of Lake Superior, and in the



Moth plane on floats, used for fire protection



vicinity of Rainy Lake, about 1845. Some ten years later, fires commencing near Lady Evelyn Lake, north of Timagami, burned south-eastwards to the shores of Lake Timiskaming. Possibly the same season, a vast conflagration swept the height-of-land country to the west. Fires in the Ottawa valley burned over rich pine tracts between the Bonnechere and the Ottawa Rivers in 1851, and again between 1868 and 1876.

At about the same time, destructive fires are reported to have swept over the north shores of Georgian Bay and Lake Superior, and from the west shore of Lake Nipissing to the headwaters of the Spanish, Vermillion, and the Mississagi Rivers. Large parts of the District of Parry Sound were burned in 1877, and in 1891 and 1896 great fires occurred along the C.P. Railway west of Sudbury.

A forest fire lookout tower. From such towers as this, fires may be quickly detected and by use of telephone or radio, the fire fighting crews may be notified immediately.

Early in the present century, the development of mining camps in Northern Ontario presented unusual hazards. In 1911 seventy people met their death in the Porcupine fire, and property to the value of three million dollars was destroyed. An even worse misfortune overtook Northern Ontario in 1916, when more than two hundred and fifty people lost their lives in settlements along the T. and N. O. Railway between New Liskeard and Cochrane. The Haileybury fire of 1922 and the fires of 1938 in Rainy River District are still fresh in mind.

The periodic occurrence of unusually destructive fires has never failed to arouse public interest and alarm, and many of the notable advances made in forest protection have followed in consequence.

The first forest protection legislation in Ontario was passed in 1878. The bill, entitled "An Act to Preserve the Forests from Destruction by Fire", provided among other things for the establishment of fire districts in which, during the summer months, the use of fire was restricted. Officials of the Department were responsible for the enforcement of this Act, but it was not until 1886 that the first system of fire ranging was instituted. Under the plan proposed, licensees were invited to co-operate with the Government in protecting their limits on a cost sharing basis. The system was extended, and in 1897 fire rangers were placed on unlicensed land at public expense. Shortly thereafter it became an obligation on the part of all licensees to participate in co-operative protection with the Government, and from 1910 on, the full cost of maintaining fire rangers on his own limits was assessed against the lumberman.

A new basis of legislation was established in the Forest Fires Prevention Act of 1917, and through an Amendment to the Crown Timber Regulations, a system was then inaugurated whereby the timber licensees and pulp concessionaires paid a flat rate for fire protection.

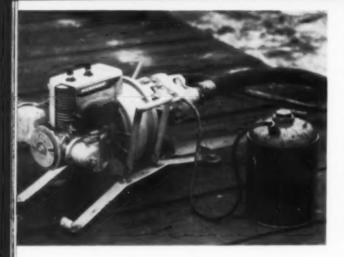
At first the fire ranging service was under the direction of the Woods and Forests Branch of the Department; but in 1917 control was transferred to the Provincial Forester, where it remained until recently. At the present time, forest protection is organized as a functional service under a chief, responsible to the Deputy Minister.

The field organization, which was initiated by the Government in 1886, has expanded through the years with the growing appreciation of the value of the forest resources of the province, and a better knowledge of the size of the protection job involved. It has developed in strength and technical skill, employing new means of observation, communication, and transportation, as available, to serve its needs. For purposes of administration the province is divided into regions and districts comprising forty-one Chief Ranger Divisions. In the summer season the staff includes from 800 to 1000 fire rangers. many of whom are specially trained in various skills — as towermen, mechanics, pump operators, truck drivers, patrolmen,

Prior to the organization of the district system, fire rangers spent most of their time patrolling lakes and streams by canoe, and roads and trails on foot. Travel was slow and difficult, and means of com-

District Forest Fire Protection Headquarters, at Armstrong, Ontario









munication were non-existent. Thus fire fighting was rarely effectively applied. The modernization of the service began with the purchase of equipment — power-driven, portable fire pumps, tools, trucks, railway motor cars, motor boats, tents, blankets, etc. There followed a programme of building. A system of steel towers for detection purposes was constructed, and connecting telephone lines were strung for rapid communication. Cabins, storehouses, and other buildings for men and equipment were erected.¹

L. In 1940 the physical assets included the follow	ving:
Major Equipment	No
Fire-fighting units, gasoline driven	5433
Linen fire-fighting hose	1,800,000 (ft
Portable hand pumps	
Tents	1330
Blankets (pairs)	9974
Canoes.	1018
Motor boats.	47
Auto trucks	110
Railway motor cars.	47
Velocipedes	
Outboard motors.	244
Major Improvements	
Lookout towers, steel	212
Lookout towers, wooden	72
Hose drying towers.	0-4
Storehouses	133
Cabins and other buildings	803
Telephone lines (miles)	4296

Aircraft

In the use of aircraft for forest protection, Ontario was a pioneer. The province owns and operates the largest aerial forest fire-fighting organization in the world. This is not a chance happening, but is due, in part, to the fact that the areas served are sufficiently well watered to permit of the use of this type of equipment to definite advantage. The Air Service was organized in 1924, primarily to supplement the detection service then in effect; but it was not long until it became apparent that it could serve a broader and more useful field in the transportation of men and supplies to actual fire locations.

Starting with a complement of fourteen war-time flying boats of rather limited

Portable forest fire pumps and railway speeders are used extensively inforest fire protection work.

capacity, it has extended and kept abreast of developments in the aircraft field until to-day it operates a total of twenty-seven aircraft from seventeen different bases, and employs a staff of approximately eighty during the operating season. The fleet of twenty-seven seaplanes is composed of ten purely detection machines, three heavy transports, and fourteen semi-transports. Three of the purely detection type are held in reserve against accident and mechanical failures. The semi-transports have a carrying capacity of approximately 800 pounds, and the heavy transports approximately 1600 pounds. Six of these machines are radio equipped with two-way voice-to-voice communications

It has been found from years of experience that to conserve our timber resources and avoid the heavy expense incident to fires which reach the out-of-control stage, it is imperative not only that fire be detected in its early stages, but that suppressive action be taken while it is still confined to a small area. It may be appreciated that aircraft play a very important part in fire protection, and there can be little doubt that this speedy method of transportation has saved many a situation which would otherwise have meant incalculable loss to the province.

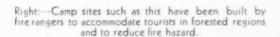
Radio

Radio has become a very important element in the communication system of the protection service. To-day, equipment is used in lookout towers and in aircraft, as well as on the ground. All of the equipment has been designed and built by the Department specially for forest fire protection purposes. The introduction of radio for communication purposes links the extensive and far-flung forest protection organization — headquarters with lookout towers, ranger stations, trucks and boats on patrol, aircraft in flight, and fire ranging crews.

Investigation and Education

A careful study is made of all circumstances related to the origin of every forest fire, and, as a result of definite knowledge thus gained, intelligent precautionary measures are applied.

Educational and other means of reducing fire occurrence traceable to human origin have proved effective; only a full sense of responsibility and alertness by the general public will, therefore, eliminate this deadly hazard.



Bottom right:—Ranger-built forest service canoe, with outboard motor attached

Below:—Type of forest protection motor boat used on the "Great Lakes" of North-western Ontario.









These two woodlots were once equally productive, but the one on the left is steadily deteriorating due to cattle grazing, while the other, with cattle excluded, is steadily improving in growth conditions providing for a sustained and productive wood crop.

PART IV

Reforestation in Ontario

The past attitude of the people of Ontario toward the forest has been one of exploitation, with little regard for the resulting conditions as related to soil and water conservation or even to the future of our forest crops.

Southern Ontario has been denuded to a point where many counties have less than ten per cent of woodland and some 135 townships have less than five per cent. Much of the remaining woodland is badly culled and thousands of acres, unfit for agriculture, have been cleared and left abandoned or worthless.

We find many of the older countries of Western Europe, where the demand for land for food crops is very urgent, maintaining 18 to 25 per cent of forest.

Many phases of conservation are fundamentally dependent on the maintenance of a forest cover. It is well recognized that watersheds protected by forest cover will regulate and maintain a better water supply. Forest cover will assist in the storage of ground-water, so important to agriculture, and prevent the drying up of wells and springs. An eminent American authority on conservation says of ground-water that it is the essential basis of agriculture, and that in some parts of the United States, the level of the water-table has been lowered from ten to forty feet as a result of excessive run-off due to deforestation.

In many parts of older Ontario large areas of light sandy soils exist which were unwisely cleared for agriculture. In many places these areas developed into sand wastes, thus becoming a menace to adjacent agricultural lands. These idle waste areas, being of no productive or assessable value, become a burden to the municipalities in which they are located. Attempts at farming on these soils are continually being made, only to end in failure.

By putting these waste areas under forest management and producing crops of trees, a source of labour could be developed which would be an important factor in any reconstruction plans for the future. Pre-war woods work in Germany afforded

employment at the rate of one person fully employed for approximately 100 acres of forest land. Several times as many were actually employed on a part-time basis. Manufacture and distribution of forest products employ probably twice as many

persons as forestry and logging.

Public opinion is being educated to the necessity of maintaining a reasonable amount of forest cover for the indirect benefits, but the question frequently arises as to the financial returns to be expected from forest crops. Planted forests in Ontario are too young to give accurate data regarding financial returns. We do know, however, that some of the forest plantations made twenty-five to thirty years ago are now producing over one cord of wood per acre per annum. Records from Europe of forest growth indicate that we can expect at least the above figure. European state and community forests have been paying an annual net revenue of from three to twelve dollars per acre.

In the following paragraphs I would like to outline the development of reforestation as it exists in Ontario.

In 1904 the Ontario Government initiated the policy of giving attention to the problems of forestry in Southern Ontario. A start was made at the Ontario Agricultural College when a Forestry Department was created, with a lecturer in Forestry in charge. A course of lectures was instituted for students in Agriculture. A forest nursery was established to supply land-owners with planting material to restock woodlots or plant waste portions of the farm. By 1908 the college nursery was distributing about 400,000 trees.

Forest Nurseries

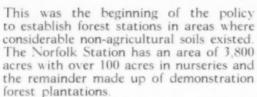
Owing to lack of suitable space and nursery soils at the Ontario Agricultural College, it was decided in 1908 to establish a forest station in Norfolk County where a great deal of cheap, sand land existed.



Ontario woodlot of sugar maple with fine reproduction







In 1922 additional provincial forest stations were established in Simcoe County at Midhurst and in Durham County at Orono. The Midhurst Station contains about 2,500 acres and the Orono Station 300 acres. The combined output of nursery stock for the three stations runs from fifteen to twenty million trees a year.

Tree Seed

In carrying out any reforestation programme it is necessary to secure a good supply of coniferous seed. A provincial forest seed station is located at Angus in Simcoe County. This plant is equipped with storage buildings capable of handling twenty-five to thirty thousand bushels of cones, and seed storage vaults with thermostatic control.

Left to right:—Sand dunes in South Norfolk as they appeared in 1907 and thirty-four years later, following reforestation. Provincial Forest Station



Top left and above:—These sand lands—mistakenly cleared for agriculture and now abandoned wastes—once contained good stands of white pine.

Left:—Forest and farm are gone — the barren limestone outcropping remains.

County Forests

One of the interesting phases of reforestation is the development of County Forests. Many counties contain large adjoining areas of poor soils which are idle and a burden to the municipalities in which they are situated. In 1911, legislation was secured to enable counties to acquire land for forestry purposes and to enter into arrangements with the province for the development of such lands. It was not until 1922 that a start was made when Simcoe County purchased the first one thousand acres now known as the Hendrie County Forest. Since then, twelve counties have taken advantage of this arrangement. Over twenty-five thousand acres have been acquired and reforested. Many of the earlier plantations are now from twenty to thirty feet in height and demonstrate the feasibility of making these idle lands productive. There are still thousands of acres of similar lands awaiting development.

Demonstration Plantations

Several hundred demonstration plantations have been made by towns, cities and





Above: Nursery beds of white spruce, with seed beds in the background

Top right:—Block of four million red pine transplants, with seed beds in the background

Right:—Four-year-old plantation of jack pine, on poor sandy soil

townships. These comprise small plots of from five acres to a few hundred acres and are for various purposes,—to protect city watersheds and waste areas along highways, and frequently to stop drifting sand which is menacing the highway.

School plantations are being developed, and to date several hundred schools have made forest plots of one to ten acres in size.

Boy Scout Forests

Two Boy Scout Forests are being developed, one in Simcoe County near Angus where the county in 1929 acquired 900 acres, and on which the Scouts have planted to date 1,250,000 trees. In 1940 Norfolk County acquired land on which the Scouts have since planted 50,000 trees.

Zone Foresters

A recent important development in forestry policy for Southern Ontario is the creation of district or zone foresters. It has been felt that the best results can be had by decentralizing extension work and placing foresters in the field who will be in a position to contact landowners on the ground. Like agriculture, forestry deals







with the best use of the land, and personal contact will prove more satisfactory than letters and bulletins. Southern Ontario is being divided into five zones.

One of the phases of extension work which these officers can develop is the better care and improvement of existing woodlands. The proper management of these private woodlands is an important factor in maintaining a reasonable percentage of forest cover for agricultural Ontario. Protection from fire and the grazing of cattle is being strongly advocated. Improving the woodlot by introducing the more valuable trees, as ash and walnut, thereby making the land produce the best quality, is also being encouraged.

There has been a keen interest developed in forestry matters by municipal officers, boards of trade and agricultural organizations. Public opinion is expecting a comprehensive scheme for dealing with the vital question of conservation. The policy of improving forest conditions in Ontario has many arguments in its favour. It will pay as a financial investment, assist in ensuring a wood supply, provide labour in rural districts, protect watersheds, conserve water, and provide breeding ground for birds and wild life.



Fifteen-year-old red pine plantation at Provincial Forest Station, Orono, Durham County, Ontario



Left:—Shallow plow furrows in which the small trees are planted five to six feet apart. Northumberland County Forest

Bottom left: Four years later

Below: Ten years later





PART V

Ontario Forests in Post War Rehabilitation

The Province of Ontario divides itself into two regions with respect to this subject, each region having its own particular problems.

Southern Ontario Region

The problem in Southern Ontario is largely one of settlers' woodlots and the rehabilitation of abandoned or marginal farm lands. There are three main considerations in Southern Ontario:

 It will be necessary to make an experimental study to determine what should be done, and what financial outlay is necessary to bring back the denuded or partly denuded forest lands.

Extension Foresters should be stationed amongst settlers to provide assistance in their woodlot problems.
The immediate need here is to provide a skeleton administrative staff, so that the districts will be organized after the war.

Southern Ontario has been divided into Forest Zones and from the Department's existing staff, Zone Foresters have been provided. Extra staff will be required after the war in these zones, and this staff will have to be of a technical nature.

3. A subsidy may be necessary on farm lands throughout Southern Ontario to encourage tree planting. The province now provides trees free of charge, but there is no inducement for a man to hire extra labour to plant trees. Some form of Federal subsidy to match the contribution of the province would be a sound move for post-war rehabilitation in this

Northern Ontario Region

The main problem in Northern Ontario is to place under proper forest management the extensive area of timber land lying north of the Southern Ontario agricultural region. The following measures would appear acceptable:

Red pine plantation made in 1913, at Provincial Forest Station, Norfolk County. This land, abandoned for farming, is now producing over one cord of wood, per acre, each year.

- (a) More adequate measures for forest protection.
- (b) Provision of transportation facilities, particularly permanent roads and stream improvements.
- (c) Recreational facilities in areas of high tourist value.
- (d) Cultural treatment of young growing stands of valuable species on accessible areas.

The chief need in attaining these ends is one of staff,—both seasonal rangers and permanent technical men.

At the present time, the administrative districts in Northern Ontario are of such tremendous size that the Department's Forest Administrators can only hope to lay down broad lines of organization, and suggest policy steps. To administer and manage this land properly will require a much greater staff than is now employed or than the province can afford to hire.



Although it is not known how many will be available for such work after the war, it is felt that the Department should break its needs into unit cost per man, and leave to the Federal Government the decision as to how many men are to be employed, and who should pay them.

The Department could use several thousand seasonably employed rangers to advantage at any time, provided it is not called upon to shoulder the burden of administrative overhead. A number of all-year technical men, or men trained by the Department, could be used in its existing organization.

It might seem that the question of employing returned men on Forestry work should be the chief concern of the province because it manages the natural resources. But only a small proportion of the wealth issuing from the forest comes to the Provincial Treasury. As the greater bulk of money acquired from the development of natural wealth goes to the Federal Government, it is felt that a subsidy for post-war rehabilitation, with the expenditure of the money under provincial authority, is the most economical and reasonable way to handle the problem of employing returned soldiers, and at the same time

attaining general forest management in the Dominion.

Conclusion

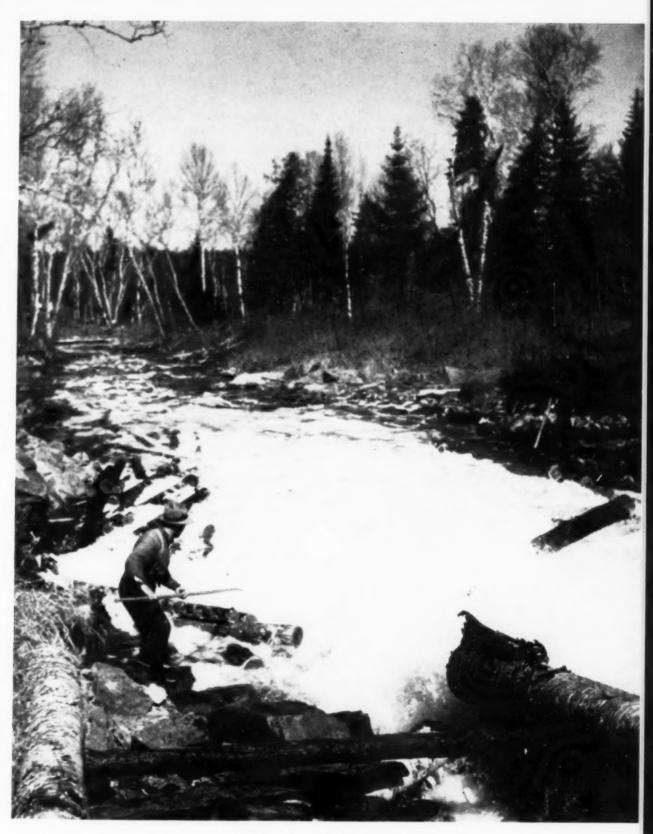
The use of wood and the use of the forest should progress to meet the needs of the changing world; therefore, a knowledge of basic principles of forest growth production is necessary. Plans must be far sighted and well in advance of current practice to allow for the time lag between the beginning of any study and the adoption of the findings into forest management.

Forest research, therefore, forms a basic part of the forest policy of the Department. The Department of Lands and Forests is the trustee and manager of the forests, the lands, and the waterpowers owned by the people of Ontario. It will, through research and management, try to administer these properties wisely so that they improve steadily in use and in value. As they are wisely managed and as they improve in value and use, so will the lives of those who depend upon the forest gain in health and happiness.

Photos courtesy Dept of Lands and Forests, Toronto; Dominion Forest Service, Ottawa; Public Information Branch, Dept. National War Services, Ottawa.



Forest tree seed extracting plant at Angus, in Simcoe County, Ontario



Logs rolling down chute of a northern stream

THE TRANS-PERSIAN RAILWAY

by E. R. YARHAM, F.R.G.S.

THE most remarkable military railway achievement of the war has been the modernization and operating of the Trans-Persian line.

When Germany attacked Russia, Mr. Churchill declared at once that aid to the Soviet Union would only be limited by the capacity of transport to handle it and by geographical difficulties. Although the obstacles have been formidable, that pledge

has been fulfilled.

Access to Russia is not easy: Japan's entry into the war has closed the Vladivostok route; both the Baltic and the Black Sea are shut to British and Allied shipping; in the North the lines of communication from Murmansk have been threatened, while Archangel is besieged by ice for five months of the year. Iran, or to use the more familiar name, Persia, offers by far the most valuable gateway into Russia; even though it is not readily accessible to British and American ships, it is conveniently situated for supplies from South Africa. India, and Australia.

In former days transport in Persia was seriously handicapped by lack of good roads and railways, and they are still few; but under the ex-Shah who, despite his shortcomings, was an enthusiast where the modernization of communications was concerned, revolutionary improvements were effected. Of these, by far the most important is the famous Trans-Persian Railway the first and most ambitious railway construction work carried out by Riza Shah-Pahlevi. This magnificent feat of engineering, recognized by engineers as one of the outstanding railway achievements of the century, was once described by Lord Lamington as "the world's last great railway". Perhaps he was right, for few, if any, of the remaining parts of the earth's surface not yet metalled could have offered such nearly insuperable difficulties to the building of this line. To-day there is something spectacular about this long narrow snake of iron road between Bandar Shapur and Bandar Shah, winding its way through masses of towering mountains, athwart great gulfs and over a great sunbaked plateau, where the heat is so intense that even the Arabs dare not touch the

rails in the middle of the day. To reach that plateau, with its several fertile valleys running east and west, the line, running north and south, crosses the formidable Elburz Mountains and negotiates the even more imposing mountain mass of Luristan. Not many years earlier, the idea of driving a railway almost to their summits would have seemed a foolhardy conception.

Until the pioneers of this railway arrived, little had been altered in Persia since the pre-Christian era, and even the means of transport were the same as in medieval times; it still took a caravan many weeks—sometimes months—to make the dangerous and toilsome trek between the Persian Gulf and the capital. Although projects for railways were in the air even before the last war, nothing was done except that the Russians built the line to Tabriz, and a short line was laid south from the Caspian, but afterwards dis-

mantled.

In 1926, however, two American engineers surveyed a route for a line designed to link Teheran with the two richest parts of the country—the oil-bearing region of the South, and the semi-tropical littoral of the Caspian. The latter is the province of Mazanderan, which grows large quantities of rice, besides sugar and citrus fruits, while there are excellent prospects for tea, American cotton and tobacco. Until the completion of the Trans-Persian Railway, most of these commodities were sold to the U.S.S.R., but there has been a growing trade with the barren South of late. Work was begun the next year, the southern section from Bandar Shapur being entrusted to an American syndicate, and the northern, between Teheran and Bandar Shah, to a German firm. The ex-Shah officially opened two sections, one in 1929, the other the next year, when he was somewhat unfortunate, as his train was twice derailed and finally caught fire. Then the Persian Railway Ministry took over the project, with the idea of completing the line under the guidance of Swedish and American experts. Finally a Danish syndicate was appointed to replace the Swedes and the Americans, and

it controlled the entire construction work under the supervision of the Railway Ministry. Various sections were "farmed out" to engineers of other countries, and the work was pushed on with the utmost vigour at the behest of the ex-Shah, who at least had the virtues of enterprise and audacity.

Probably few other of the world's great railways owe their construction to engineers of so many nationalities; they came from Australia, Belgium, Sweden, Denmark, France, Germany, Great Britain, Greece, Italy, Russia, and the United States. We can take justifiable pride in the fact that British engineers were res-

ponsible for one of the most difficult sections of all, an eight-mile length running through part of the mountain mass of Luristan, which is 120 miles across. It compared in difficulties of construction with blasting a way for the Canadian Pacific Railway across the Rocky Mountains. Credit must be given to the local workmen as well as to the hundred or so trained engineers from the Old and New Worlds and the few score skilled masons brought to Persia to carry out important work on such structures as bridges and culverts. At the peak period of construction, between 40,000 and 50,000 workmen were employed, and hardly one of them had ever heard of,



much less seen, a railway before in his life. Their chief weakness was a habit, in the South particularly, where lack of water was sometimes serious, of deserting without warning at the slightest sign of drought, and disappearing into the desert—of all places; but with his uncanny nose for water, the Arab quickly finds it even in inhospitable wastes where a white man would swiftly perish.

Some idea of the formidable obstacles which had to be overcome may be gathered from the fact that at one place the line takes 41 miles, spiralling up steep gradients, to cover 22 miles as the crow flies; in another section there are no fewer than 150 tunnels in 38 miles; one tunnel a mile is quite common. About 450 bridges and culverts had to be built to overcome the floods to which the desert country is liable. The monthly consumption of cement for these and the tunnel linings approximated 10,000 tons, and 100 tons of explosives were used monthly. All these materials had to be brought up over one of the fiercest zones of heat in the world, where roads are few and poor. Barracks had to be built for thousands of Persian workmen. and hospitals and dispensaries had to be set up and staffed to deal with frequent cases of accident inevitable under such conditions, and with illnesses such as malaria. In some places temperatures soared to over 130 degrees in the shade, and some of the Eurasian workmen died from the ill effects of this blazing environmena

The northern section of the line is shorter, and until it reached the foothills of the Elburz there were few obstacles; but there the real trouble began. The face of the mountains is extremely steep and the gradients would have been far too severe for any line: so it was made to climb slowly up in huge spirally curved zig-zags to almost 7,000 feet. Leaving the forests at the foot, it goes through a rocky gorge no more than 25 feet wide and actually climbs 6.000 feet in 50 miles. The difficulties of construction were accentuated by the rottenness of the slopes, and strong retaining walls were necessary. Some of the spirals had to be enclosed in tunnels a mile long and, at one place, where a whole hillside was on the move, the rails had to be "threaded" through a concrete tunnel which, itself, had to be kept from slipping down by concrete walls 80 feet high. Added to these obstacles were those

of heavy rain and frequent severe earthquakes. Almost at the summit the line passes through the longest tunnel—over a mile and three-quarters; then it descends under a salt mountain, abuts on the desert, and finally runs into a fine modern station at Teheran. Farther south it touches Qum—holy place of pilgrimage—before crossing the Karun by a splendid bridge five-eights of a mile long, built by an English firm. This bridge also carries foot and car passengers, and is regarded as the finest structural piece of engineering along the whole railway.

The British section is situated in this southern portion, and a description of the contract reads: "The primary difficulties of this section lay in its almost complete inaccessibility, precipitous, barren terrain, great variations of temperature, and total absence of paths, let alone roads. As well as the great difficulty of making service roads, the eleven British engineers of the firm had to contend with a formidable death-toll among the labour, which was most difficult to obtain and retain on the work. The intense heat also made their own work extremely arduous. The cost of this section of the line was estimated at about £1,000,000. Between the tunnels, deep ravines and the torrential Ab-i-Cesar River, which the line crosses and recrosses, had to be bridged, and both the service road and railway formation had to be cut out of precipitous gorges and mountain sides where there is always danger of landslides.

To begin with, an £80,000 road had to be built along the sides of the mountain for the transport of food, workmen and equipment. But before they could start, the engineers had to get to the scene of operations, which meant swimming the river which sometimes rises 20 feet in an hour, and they finished with blistered feet. arms, legs, and backs, with swollen tongues and parched throats, the result of ten hours working in the scorching heat. The engineers told how they worked in veritable ovens, "particularly in the canyons, where the heat was so great one could not touch the rocks and breathing was difficult' Heat was not the only enemy, for on one occasion bandits attacked a cashier, killed his bodyguards, and got away with £2,000; indeed, until the completion of the railway, travellers dared not pass through Luristan unless heavily protected. The British engineers had to drive several tunnels along

the Ab-i-Cesar, the longest being over a mile. So accurately was it planned that when the last shot was fired the difference in line was only half an inch, and the level was dead right. It was so hot, even at night, that sleep was impossible; but they toiled on, breaking all known rules for work in such climate—and triumphed. The line was completed in 1938, after just over ten years work, at a cost of £28,000,000. Persian finances have stood the entire cost of the railway, but the heavy monopoly taxes imposed on tea and sugar to meet this liability were among the reasons for the ex-Shah's unpopularity. The cost works out at £35,000 per mile on the average, but some stretches-for example, the British section—through the titanic mountain barriers cost over £100,000 per mile.

Apart from military considerations, what will be the value of this marvellous piece of engineering to Persia? Actually, even before the present war, it was making its civilizing influence felt, for the ancient systems of transport-camel and packhorse-were being superseded by motor transport of goods and passengers to the railheads. Already there is evidence of new settlements along the route, and postwar years should witness the growth of new and modern towns. Just now, however, military considerations prevail, and, unfortunately, before the line could be of much use as a highway of transport for war supplies to our Ally, an immense amount of work was necessary. When, after Persia had been weaned from the pernicious influence of the Axis, British and Indian engineers came to examine the line, they found that it had only a miscellaneous assortment of engines, about half of which were unserviceable as the result of ignorant handling by the Persian staff, the skilled European cadres having been discharged on grounds of economy. This was but one of many troubles, and a tremendous amount of work has been necessary along the whole of the permanent way. The line was probably working comparatively efficiently according to Persian standards, but there is a vast difference between those and Western conceptions of railway transport, and especially the high standards a war demands. Immediately British and Indian engineers took over, the line was tackled with the object of adapting it to war-time traffic. Military engineers all know that the capacity of a railway in an undeveloped country can usually be largely increased for campaign purposes by the

provision of extra sidings and crossingplaces for trains, and of better distributed shops for minor repairs and rolling stock. Such work has been going ahead rapidly, together with the strengthening of bridges and the improvement of approach roads along the entire length of the 808 miles from Bandar Shapur on the Persian Gulf to the Caspian terminus of Bandar Shah.

Although Britain has played the leading role, the United States has been giving increasing assistance. Mr. Averill Harriman, who headed the American delegation to Moscow, was the first to disclose that his country was helping in the construction work to strengthen the line. Although they were still then at peace, Mr. Harriman declared: "We are not giving lip service to an ideal. We Americans are giving practical service to Russia, and an American mission under Brigadier-General Raymond A Wheeler left for Persia to help speed up supplies for Russia. The officers of the mission are supplemented by a large staff of civilians to hasten the delivery of supplies, to develop road and rail routes and create facilities for assembling, repairing and maintaining aircraft, tanks, and guns." It was also reported that as many as 300 American locomotives were likely to be sent to Persia particularly for work on the Trans-Persian line. In Britain the Prime Minister took swift action, as Lord Beaverbrook revealed: "The Prime Minister's telegram to Stalin was followed by action of the most determined character. In this and in matters of transportation he had taken the most remarkable precautions. Necessary locomotives and rolling stock for the re-equipment of Persian railways were already in process of delivery

Indeed, not only Britain but other parts of the British Commonwealth leaped to the opportunity which presented itself. One of the most notable steps was taken by Australia, which decided to send railway stock worth £1,000,000 to Persia. This ranks as one of the most important contributions to the war effort which the Commonwealth has ever made. The Federal Government curtailed trans-continental services in order to send locomotives, and it has kept the remaining New South Wales rolling stock moving 24 hours a day to prevent a local transport bottleneck Locomotives have also been shipped from India and Hong Kong, while goods waggons, rolling stock, and spare parts have been reaching Persia in increasing volume. Now the bulk of materials-arms, machinery, tin and rubber—will be immense, but it is hoped that the modernized railway will be able to cope with everything sent, and thus avoid a hold-up of valuable shipping in the Gulf, which, despite Axis attacks at sea, is more crowded with vessels than ever before in history. The objective is to move at least 3,000 tons of goods over the line daily.

Some idea of the difficulties which the engineers have been facing in refitting the line for heavy traffic can be judged from the following. The southern terminus is Bandar Shapur, on the Gulf. That place was built largely on ground reclaimed from the sea, but much mud still remains and the jetty had to be built over a mud-flat. When the British Army arrived last year, Bandar Shapur did not deserve the name of port, for only two average-sized steamers could lie by the jetty at the same time. Now it has been altered out of all recognition, and the Persians will have something to compensate themselves with for having temporarily to sacrifice their line, of which they are very proud, to other people's uses. A very marked increase of freight was recorded at Bandar Shapur before the end of the year, vessels of almost every nationality free to trade, including Dutch, Greek. and Norwegian merchant ships, unloading valuable cargoes By the end of November the former maximum number of trains on the Trans-Persian route had been quadrupled-an astonishing achievement in so short a period of occupation. In addition, a by-pass has been provided in case of congestion; goods are ferried up the River Karun (Persia's only navigable waterway) by lighter to Ahwaz, about 50 miles north of the port, and they are put on the line

The shortage of locomotives, already referred to, was especially felt about 100 miles beyond Ahwaz, where there are almost precipitous gradients. Up to that point the line was able to handle the cargoes which were discharged at Bandar Shapur; but from thence onward, starting at Andimeshk, just to the north of Dizful, the trains had to be divided. This would not have been a disadvantage had there been plenty of locomotives, but they were lacking when the British and Indian engineers took over. In order to obviate this difficulty to some degree, during recent months the bottleneck has been relieved by sending

on some materials from Andimeshk by Soon, however, there should be road. sufficient rolling stock and locomotives to handle the heaviest freights efficiently. At the extreme north of the line are the twin ports of Bandar Ghaez and Bandar Shah. The latter is the terminus, and it lies on the Turcoman steppe, close to the end of a new military road at Asterabad. Bandar Shah is a new port, but, unluckily, the continually receding Caspian has already left it almost high and dry. The sea at this point is so shallow that a pier 2,000 yards long is necessary. The improvement of the facilities here has been left in the capable hands of our Russian allies. Bandar Shah is linked by regular sea route to the Russian ports of Baku in Caucasia, and Astrakan, situated on the delta of the Volga.

The British Transportation Directorate. fittingly established in the former offices of the German Steel Combine in Teheran, is humming like a hive under the forceful direction of Brigadier-General Rhodes. The amazingly rapid advance of the Imperial armies in East Africa is still fresh in our memories. To a marked degree that was made possible by his work; it was his duty to solve the railway and harbour problems arising from the unprecedented strain on transport imposed by the arrival of many thousands of troops and large amounts of material, particularly at Mombasa. He performed that task with outstanding distinction. During the last war he was Director of Railways. British Salonika Force, and later he was loaned by the Colonial Office to serve as chief engineer. Uganda Railway, and in 1926 was appointed Deputy General Manager and Chief Engineer, Kenya and Uganda Railways and Harbours. Four years later he became General Manager, and under his regime the undertaking has attained a high level of efficiency. The functions of the Directorate in Persia are to plan and supervise the development of road and rail communications, and particularly the considerable enlargement in progress at Bandar Shapur. The appointment of a man of the calibre of General Rhodes is a proof of the determination of the British Government to get all possible aid to Russia, and also of the high strategic importance of the trans-Persian communications.



REGULATIONS EFFECTIVE: SEPTEMBER 1, 1942

*THOSE AFFECTED

ONE GROUP of regulations (A) applies to all workers, male and female, and their employers, except any persons employed:—

As female domestic servants in homes where there is not more than one servant employed; By a provincial government; As ministers, priests or clergymen; In casual labour; As professional engineers or science workers under the Wartime Bureau of Technical Personnel; In part-time subsidiary employment which is not a regular occupation; In agriculture, hunting, fishing, trapping; As teachers; As nurses and probationers; As students at work after school or on holiday other than long summer vacation.

The other Group (B) applies to all workers.

*THE REGULATIONS

GROUP (A)

- 1. No worker may quit his job without giving his employer seven days' notice in writing.
- 2. No employer may lay-off or discharge any worker without seven days' notice in writing.
- 3. No employer may interview or engage any worker unless worker has a permit to seek employment.
- 4. Permits to seek employment may be obtained from National Selective Service officers in Selective Service offices, formerly the local offices of the Unemployment Insurance Commission.

GROUP (B)

- 5. A National Selective Service officer has the power:
 - (a) to order any person to report for an interview at the local office,
 - (b) to order any person who has been unemployed seven days to take any suitable work; and
 - (c) to order any partially employed person to take any suitable full-time work.
- 6. No person ordered by a National Selective Service officer to take a job may quit such job without permission of the officer.
- When a worker has to travel to a distant job, the National Selective Service officer may pay the cost of transportation and certain other special allowances.
- 8. If a worker at the request of the National Selective Service officer changes from less to more essential work, he may claim re-instatement in his former job when the more essential work is finished.
- 9. Any employer, employee or other person who violates any provision of the regulations or any order made under them is liable to a fine not exceeding \$500 or a jail term of not more than 12 months or both

Note:—Agricultural workers may take seasonal or temporary employment outside agriculture with the consent of Selective Service Officers when such work will not interfere !with farm production and by taking such work they will not lose their right to postponement of military service.

*EMPLOYERS

Read the orders-in-council setting up the regulations and the Explanation of National Selective Service Regulations which can be obtained from Selective Service offices.

*EMPLOYEES

Read the orders-in-council setting up the regulations and the Workers' Handbook which can be obtained from Selective Service offices or offices of trade unions.

ELLIOTT M. LITTLE, Director National Selective Service HUMPHREY MITCHELL, Minister of Labour

FAMOUS EXPLORER PASSES.

The recent death of Sir Francis Younghusband, who had reached the advanced age of seventy-nine, closed the career of a man who earned international renown as

a soldier, explorer and author.

In recognition of his outstanding services, he received many of the highest honours and awards of the British Empire. The son of a distinguished soldier, Sir Francis graduated from Sandhurst and was soon posted to India for service. At the early age of twenty-three he had already begun his explorations in Manchuria. Four years later he was transferred to the Political Department of India, where he had wide scope for his military, diplomatic and exploratory talents. In the following years he travelled widely in Northern India, China, Turkestan and South Africa.

His work in connection with Tibet is perhaps the best known of his career Many have read accounts of some of Sir Francis' thrilling adventures in that country. There are, however, few who realize that his work at this time and later resulted in an extension of the Indian system of triangulation, and even led to the determination of the geographical position of the Forbidden City itself. He discovered, too, that the Muztagh is the true water-divide west of the Tibetan plateau. Yet the man of science, the soldier, the diplomat, could experience to the full the grandeur and awe of the Himalayas, and could thrill to the perfection of design and glory of colour of

a common wayside flower.

It was on the appropriate subject of his famous expedition to Lhasa that Sir Francis, a past president of the Royal Geographical Society, graciously addressed the members at the inaugural meeting of The Canadian Geographical Society in 1930*. On this historic occasion he presented to the President the beautiful sword and scabbard given to him by the Chief of Bhutan, who accompanied him to These were later donated to the National Museum

Sir Francis' travels and explorations resulted in many intensely interesting books, written in a lucid entertaining manner, brightened by a strong sense of humour. This style gained him extensive recognition as an author and delighted many an audience. Even his scientific papers are never dull. So vigorous was his mind that he continued writing until a short time ago. His death completed a full life well-lived - a life worthy of the highest traditions of his country and of his profession.

*See "In the Heart of Asia", by Sir Francis Younghusband, Canadian Geographical Journal, Vol I, No. 1, p. 53. P. E. PALMER

EDITOR'S NOTE-BOOK

Edmund Robert Yarham has provided readers of the Canadian Geographical Journal with a timely and most instructive article. With Russia constantly in the headlines, and our determination to provide her with weapons of war ever increasing, many people are wondering just what the question of "aid to Russia" involves. One has only to look at the map to realize the magnitude of problems connected with transportation. An account of the trans-Persian railway is, therefore, of vital interest

Mr. Yarham is particularly well equipped to handle this material, being a graduate of the University of London, a Fellow of the Royal Geographical Society, and a member of the Royal Society of Teachers. He also holds the Silver Medal of the Royal Geographical Society for the Cambridge University Certificate Examination. For the past fifteen years, he has travelled and lectured extensively, broadcast for the B.B.C. on geographical subjects, and contributed to the chief geographical journals and magazines in Great Britain.

IN MONTREAL A Modern Hotel with Old Traditions of Hospitality. ON DOMINION SQUARE J. ALDERIC RAYMOND

THE SOCIAL SCIENCES

BRIEF SURVEY OF RECENT LITERATURE

The paucity of materials in the social sciences in Canada has been conspicuous in the field of text books for colleges and universities. Small texts based on Canadian materials have been used in high schools over a long period but in the advanced work Canadians have been negligent. Since the outbreak of war there has been a notable effort to repair the deficiency. H. A. Logan and M. K. Inman, A Social Approach to Economics (Toronto, 1939) was based on long experiences in teaching in the University of Western Ontario. It follows the general pattern of economic text books but emphasizes Canadian illustrations, and, as would be expected from Professor Logan's work in the field of labour and from the title of the book, includes an extensive account of institutions and an important consideration of consumption. book is a landmark in the history of the teaching of economics in Canada. There has been a revolt against text books in advanced teaching and those interested in its character will find it sharply reflected by the late Robert MacQueen in "The Approach to Economics" Canadian Journal of Economics and Political Science, February, 1940. Professor Bladen in An Introduction to Political Economy (Toronto, 1941) has attempted to meet the criticisms, to develop a text book for students in the first year of college work and to extend the range from economics to politics as the words political economy suggest. The first three chapters are designed admirably to acquaint the uninitiated with the content of modern economics. Later chapters supplement the approach by discussion of population, wheat, newsprint, combines and labour. A third book, Professor B. S. Keirstead, Essentials of Price Theory (Toronto, 1942) carries the student into the more abstract reaches of economic theory It is a logical extension of Professor Bladen's book and is solidly grounded on Canadian experience. Professor M. F. Timlin, Keynesian Economics Professor M. (Toronto, 1942) rounds out the superstructure in the teaching of economic theory in Canada. deficiencies in the development of economic theory have hampered work in practical fields. ture in the field of marketing has been limited and slight in value in spite of the intensive work carried out in various fields particularly by advertising agencies. In an attempt to make the results of various investigations available, a series of ten lectures was arranged in the University of Toronto with the co-operation of the Advertising and Sales Club in 1939. These were edited by Professor H. R. Kemp and include lectures on statistics by Herbert Marshall of the Dominion Bureau of Statistics; export marketing by Professor H. Laureys, now Dominion representative in South Africa: marketing research by Mr. D. R. G. Cowan of Swift and Co., Chicago, and Mr. Henry King of Cockfield, Brown and Co.; farm markets and co-operation by John Martin of the Massey-Harris Company and Professor J. E. Lattimer of Mac-donald College: aspects of resale price maintenance by Professor C. A. Curtis of Queen's University; retailing by Professor Walter Thompson of the University of Western Ontario: aspects of the pricing problem by Professor H. R. Kemp, and a general survey lecture on commercial policy by Professor K. W. Taylor now of the War-time Prices and Trade Board.

The success of this series warranted a continuation in 1940. The lectures were arranged on a narrower field and edited by Miss Jane McKee. The book includes articles on modern retail distribution by O. D. Vaughan, of the T. Eaton Company Limited; distributive cost analysis by W. L. White of the United States Department of Commerce; instalment credits, for and against, by Professor Ivan Wright and Mr. Eric Hehner; marketing techniques by I. D. Carson of Canadian National Newspapers and Periodicals Association, E. P. Resseguie of Scripps-Howard Newspapers, R. C. Borden of Borden Company, C. E. Macdonald of International Nickel Company and Professor K. S. Bernhardt; transportation problems by Professor J. L. McDougall of Queen's University, and interrelations between export and domestic markets, the case of bacon, by J. S. McLean, President of Canada Packers Limited.

In 1941, lectures were arranged by Mr. S. B. Stocking and published in the Commerce Journal (University of Toronto Commerce Club). It includes articles on tested retail selling policies by P. K. Heywood of Evangeline Shops Limited; a new trend in merchandising by R. F. Chisholm of Gordon Mackay and Company Limited; merchandising policies for the manufacturer by D. H. Pollitt of Campbell Manufacturing Co.; reading the public mind by Elmo Roper, director of the Fortune survey of public opinion; recent developments in magazine research by Cornelius Cu Bois, director of research for Time Incorporated; standards of sale performance by Professor T. H. Brown of the Harvard Graduate School of Business Administration, and the value and significance of advertising by S. B. Stocking.

The series in 1942 was arranged with a view to concentration on retail problems particularly during the war. The lecture were published in the Commerce Journal and included profit factors in retail merchandising by A. G. Pinard of Lowe Brothers Company Ltd.; merchandising planning and control methods by H. G. Colebrook of Robert Simpson Company, retail buying policies and procedures by P. K. Heywood: customer relations of retail institutions by J. R. Rutledge of T. Eaton Co.: manage-ment of finances of retail institutions by J. H. Suydam of the Toronto Credit Bureau: methods of controlling retail store operations by Professor M. P. McNair of the Harvard Graduate School of Business Administration: retail merchandising as a career by Professor O. P. Robinson of New York University School of Retailing; research as a need in retailing for to-morrow by Dean N. A. Brisco of the New York University School of Retailing; retail pricing policies by E. G. Burton of the Wartime Prices and Trade Board; retail store advertising M. Plant of Plant Advertising Agency

These publications are necessarily limited since they were originally given as lectures. They point to the need for elaborate detailed and extended studies in the field of Canadian marketing. H. G. Stephenson and F. C. McNaught, *The Story of Advertising in Canada* (Toronto, 1940) is a beginning in the field of advertising. We have a detailed picture of the marketing of wheat in D. A. Mac-Gibbon, *The Canadian Grain Trade* (Toronto, 1932), and H. S. Patton, *Grain Growers Cooperation in Western Canada* (Cambridge, 1928), and in *The Diary of Alexander James McPhail* (Toronto, 1940) an intimate study of the wheat pools. An understanding of marketing organization is essential to an appreciation of the significance of geography in Canadian economic development.

(Continued on page X1)





LONDON

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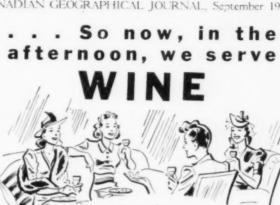
(Continued from page 1X)

The study of political science has perhaps been more urgent but has proceeded less satisfactorily than economics. Mr. C. B. Macpherson in an article "On the Study of Politics in Canada", Essays in Political Economy (Toronto, 1938), has traced the history of teaching in political science in Canada and revealed its neglect. In Problems of Modern Government (Toronto, 1941) the editor, Professor R. MicGregor Dawson, in an introduction, and President Cody in a foreword, point to the urgency of studies in political science in these times book comprises lectures given at the University of Toronto by distinguished political scientists in Canada and the United States and includes the present crisis of constitutionalism by Professor C. H. McIlwain of Harvard University, democratic possibilities in a totalitarian world by Professor H. McD. Clokie of the University of Manitoba, the impact of war on Canadian political institutions by Professor R. MacGregor Dawson, taking stock of federalism in the United States by Professor Arthur W. Macmahon of Columbia University, the federal dilemma by Professor J. A. Corry of Queen's University, Canada and the balance of world power by Professor R. A. Mackay of Dalhousie University, and the economic activity of the state in the Dominions by Professor Alexander Brady

Of all the social sciences in Canada sociology has been the Cinderella. The tangible work of Professor A. Dawson of McGill University has given it a definite place and enormously enlarged its possibilities. In a course of lectures by distinguished sociologists Essays in Sociology (Toronto, 1947) edited by C. W. M. Hart, Professor Dawson outlines his point of view in "Sociology as a Specialized Science". Mr. S. D. Clark is a former student of Professor Dawson but The Social Development of Canada (Toronto, 1942) breaks new ground in the field of sociology in North America. It is concerned with the problems of sociology as they emerge over a long period and in his approach he has the advantage of discussing institutions from an evolutionary point of view and in relation to the geographic and economic background. The chapters, for example, include the fur trade and rural society in New France, the fisheries and rural society in the Maritime colonies, the timber trade and rural society in Upper Canada, mining society in British Columbia and the Yukon, transcontinental railways and industrial capitalist society. The volume is made up chiefly of contemporary documents but they are interpreted by penetrating introductions. Mr. Clark is to be congratulated in the success with which he has not only pointed to fresh interpretations of Canada's history but to a fresh point of view in sociology on this continent

This brief survey of recent literature in the social sciences will serve to acquaint the geographer with the character of work on which we may levy tribute in explaining the significance of geography on Canadian development. Interest in the cultural approach will strengthen the work of geographers, and it will serve as a constant check on the temptation to arrive at final conclusions based on the mechanistic bias peculiar to an obsession with physical geography.

H. A. INNIS

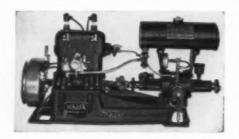


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CASTLE BLDG. - MONTREAL

Exercises in Economic Geography, by w. o. BLANCHARD, Professor of Geography, University of Illinois (McGraw-Hill Book Company, New York, \$1.00).

This book, which is now in its third edition, is, in the main, a series of questions on economic geography, for use in connection with college courses in geography. As such, it will, no doubt, be warmly welcomed by educationalists, and in its new and amplified form, prove even more useful than the earlier editions. It also includes a long list of statistical tables covering many phases of world production and trade, which are not readily available elsewhere in any one book of reference.

To those who are geographically minded, and it may be assumed that this will apply to most of the readers of the Canadian Geographical Journal, the book represents a useful yardstick with which to measure the reader's own knowledge of this subject. In these days of radio quiz contests, it might well be termed the equivalent of a geographical quiz and, as such, is heartily recommended to the readers of the Journal, who, in an attempt to answer even one-half of these questions, may arrive at a very humble frame of mind with respect to their factual knowledge of geography. It should, therefore, stimulate a desire for wider reading in this most interesting and timely of subjects and serve the general reader as a guide to those phases of geography in which his knowledge might well be augmented.

P. E. PALMER

(Continued on page XIV)

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CANADA

NATIONAL REGISTRATION OF WOMEN IN CANADA Sept. 14 to Sept. 19, 1942 THOSE WHO MUST REGISTER

All females born between January 1st, 1918 and December 31st, 1922 inclusive, who are not now in possession of Unemployment Insurance Cards Form 411 or 413 (Illustrated below). Also all those who have such cards in their possession but who are not employed in insurable employment.

WHERE YOU MUST REGISTER

You must register at your nearest Selective Service Office (formerly the local Employment & Claims Office of the Unemployment Insurance Commission), or a location set up for your convenience. If you reside in a rural area, you register at your nearest Post Office.

THE DATE OF REGISTRATION

You may register at any time between Monday, September 14th, and Saturday, September 19th, 1942.



THOSE WHO NEED NOT REGISTER

Inmates of Institutions such as hospitals and mental hospitals and members of religious orders. Those in possession of either of the two Unemployment Insurance Cards Form 411 or 413 (illustrated) and who are now employed in insurable employment.

NOTE:—If you are now unemployed, you will be required to register. If you have an insurance book number or registration certificate U.I.C. 411 or 413 which you got when you were previously employed, bring it with you when registering.

ELLIOTT M. LITTLE
Director National Selective Service

HUMPHREY MITCHELL Minister of Labour (Continued from page X11)

The Open Book of Wild Life, An Introduction to Nature Study, by RICHARD MORSE MacMillans in Canada, 1941, \$2.75). (Toronto: feetly charming book is primarily meant for children, but older readers will find it equally enjoyable. Mr. Morse, a well-known writer and lecturer, is editor of the British Empire Naturalists' Association. He has the true naturalist's happy gift of compressing an enormous amount of knowledge into comparatively small compass without sacrificing its appeal to the reader's curiosity and interest. He tells his readers a great deal that they will not find in their more formal textbooks, and indeed tells much from his own lifelong observation which the textbook does not even mention. He makes you long to get out into the fields and woodlands to verify his experiences, and, though his animals and plants are occasionally peculiar to Britain, most of them are found also in North America.

Merely to quote the titles of chapters and illustrations gives one a foretaste of the explorations to which the author entices us so irresistibly. His first chapter on the Amoeba and its relations makes any previous acquaintance with this lowest form of animal life seem quite dull and matter of fact. You wonder if the following chapters on the hydras, earthworms, snails, spiders and the rest of the ascending scale can possibly prove quite as original and thrilling, and find, to your delight, that Mr. Morse never fails to point out curious and interesting facts about each one. The drawings are most illuminating. Portraits of the centipede and millipede, for instance, bear the description: Similar in form but different in habit. The centipede (on the left) is a fierce carnivorous creature, whereas the millipedes (on the right) are strict The colour plates, sixteen in number, and the many photographs, are equally delightful no less so in the second part of the book, which leads the reader in the same interesting way to a knowledge of the evolution of plants. This is a knowledge of the evolution of plants. book to own and to share. It might be called 'Evolution Without Tears'

F. E. FORSEY

Forgotten Waters, Adventures in the Gulf of California, by RANDOLPH LEIGH (Toronto, Longmans Green and Company, 1941, \$4.50). The author of this delectable tale of adventure has had a most interesting and varied career. Political commentator, world traveller, editor and orator, he is widely known internationally. He was European correspondent for the Washington Star and the Los Angeles Times. He is the author of several books on politics, the constitution, etc., notably Citadel of Freedom and Conscript Europe. But readers of Forgotten Waters will feel that he is happiest when off on some adventure in unexplored parts of the world, especially in following up some scientific theory or problem. While visiting Spain in 1935, Mr. Leigh studied in Seville the marvellously-preserved maps and records of the old conquistadores, and to such good purpose that he became convinced that one of the most dazzling and least known regions of this hemisphere is right at our back door. This is the Mexican peninsular state, 800 miles long, of Baja California, and the great Gulf of California which separates it from the states of Sonora and Sinaloa on the mainland.

The neglect of this rich and romantic land, as Mr. Leigh calls it, is accounted for in the opening chapter, which sets forth, clearly and graphically, the geographical, historical and human obstacles to its exploration and progress. He says, nowhere else in the world are greater natural resources to be found and nowhere else are they more completely neglected. Into the Gulf of California flow eleven streams whose sands are heavy with gold. Within the Gulf are the best fishing grounds of the North American continent. In the territory adjoining it to the east and on the peninsula of Baja California to the west are important deposits of manganese, iron, copper, gold, silver, tungsten and molybdenum. Pearls are abundant and near by are some of the best timber lands in Mexico. Yet Baja California has an insignificant population, and the states to the east are not much better off . . . In addition to the tribes which have barred the white man's way in the Gulf region there have been serious natural obstacles. To the north there is the forbidding desert, to the east rise high sierras, to the south and west, the, Pacific. Nor have these triple ramparts - sand, sea and sierras-exhausted the defence of this rich land. Even when past these and within the Gulf itself, the explorer and exploiter have been con-fronted with still another hazard, that of the largest tidal bore on the Pacific.

After a year's preliminary planning, Mr. Leigh organized an expedition of his own in the autumn of 1940. In New York, he bought a thirty-five ton schooner, Lascar II, and with his wife and a lively crew of five sailed through the Panama Canal and up into the Gulf. There, joined by others, going back and forth inland and along the coast, they went about their task, covering on the entire trip approximately 10,400 miles. What they found and how they fared makes an enchanting and deeply informative record. And they had adventures a-plenty, meeting with strange primitive tribes, colonies of nudists, monuments of the Spanish occupation and the seventeenth century Jesuit missions, and encountering sharks, perilous storms and furious currents. The chapters on visits to bird islands, on whales and seals and all the teeming life of the Gulf, will delight scientist and layman alike with their keen observation and amusing ironic

Mr. Leigh is deeply concerned over the danger which he foresees that the construction of Boulder Dam and the changes it has wrought are steadily removing the barrier of silt brought down by the Colorado River and threatening to allow the stormy waters of the Gulf to eat into the rich Imperial Valley reclaimed at so great a cost to the United States government. His diagram on pages 290-291 and the accompanying chapter entitled "The Greatest Tidal Bore of the Pacific give a thoroughly scientific discussion of the whole question, with pertinent citations from Carnegle Institution and Government investigations, which, however, have not attracted the attention they urgently called for. He thinks Mexico's vital interest in the matter has not been sufficiently considered, and proceeds to make practical and valuable suggestions as to possible solutions of the problem. The illustrations, end-maps, bibliography and index are excellent features of this extremely interesting and entertaining book.